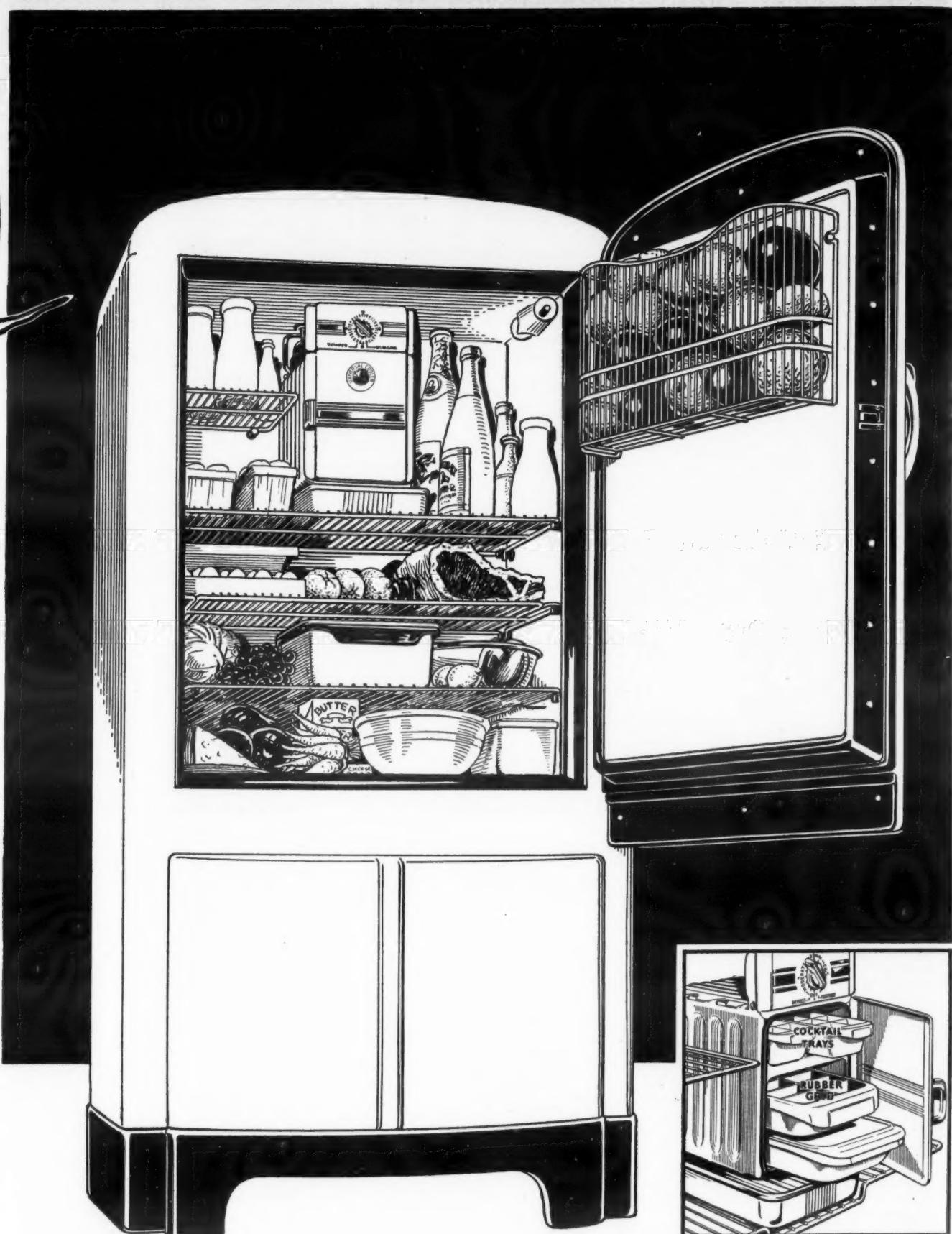


ENTHUSIASTIC RECEPTION FOR THE BEST REFRIGERATOR DEAL of 1937

YES AND *Exclusive TOO!*
BETTER GET ALL THE
facts NOW!



400% increase over last year—that is the record of Universal Cooler sales at their first 1937 showing! Interest is even greater now!

These new DeLuxe Quality Universal Coolers are sold direct—Exclusive—one dealer to a city! You can increase your volume AND your profits with this famous 15th Anniversary line, a style and model for every need.

Real sales appeal—the new flavor-retaining Down Draft "Double" Cooling; Real eye appeal—modern styling in the most friendly manner; Economical operation and long life—with the famous

current saver Life-time unit; More ice—quicker. Read what large Direct Outlets have said in their own ads—

"One of the most noiseless refrigerators ever manufactured; can hardly be heard at all!"

"A Bold Desire Fully Realized—an Electric Refrigerator that incorporates all the good points, eliminates all the bad—offered free from the great expense burden of Distribution, National Advertising, and Administration!"

No matter how large or how small your store is you can benefit through the Universal Cooler 1937 Complete-Coverage program.

Wire or Write



UNIVERSAL COOLER

DETROIT • MICHIGAN
Or in Canada, Universal Cooler Co.
of Canada Ltd., Brantford, Ontario.



APR 15 1937

WRITTEN TO BE READ ON ARRIVAL

THE NEWSPAPER OF THE INDUSTRY

AIR CONDITIONING AND

REFRIGERATION NEWS

Established 1926 and Registered U. S. Patent Office as Electric Refrigeration News
Member Audit Bureau of Circulations. Member Associated Business Papers.VOL. 20, No. 9, SERIAL NO. 415
ISSUED EVERY WEDNESDAYEntered as second-class
matter Aug. 1, 1927

DETROIT, MICHIGAN, MARCH 3, 1937

Copyright, 1937, by
Business News Pub. Co.FOUR DOLLARS PER YEAR
TWENTY CENTS PER COPY**Zerozone Offers
Four Restyled
Models for '37****Company Announces Return
To Distributor-Dealer
Merchandising Setup**

DETROIT—Introduction of the Zerozone 1937 line of household electric refrigerators was made to the industry last week by Zerozone Refrigeration Corp., a division of Dallas E. Winslow, Inc. Four models in 4, 5, 6, and 8-cu. ft. cabinet sizes comprise the new line.

At the same time it was announced that the Zerozone line will be handled through regular distributorships this year.

List prices on the new Zerozones will be: W-437, \$128.85; W-537, \$162.80; W-637, \$187.10; W-837, \$220.

Principal changes in the line include streamlining of the cabinet to secure more rounded contours and

(Concluded on Page 2, Column 4)

**FTC Again Rules On
Conditioner Ads**

CHICAGO—Reiteration of the Federal Trade Commission's ruling that all appliances which do not meet its definition of air conditioning cannot be advertised as such has resulted in the entering into a stipulation between the Gaylord Mfg. Co. of this city and the commission that the Gaylord firm will discontinue "unfair" advertising practices in promotion of its device known as the "Fresh'n'Aire."

In a previous action the Federal Trade Commission declared, in regard to proper definition of air-conditioning equipment, that:

"The words 'Air Conditioning' signify the control by a mechanical

(Concluded on Page 4, Column 3)

**Agreement Reached at
Universal Cooler**

DETROIT—A satisfactory agreement was reached last week in the negotiations between the management of Universal Cooler Corp. and representatives of plant employees' organizations, according to F. S. McNeal, president of the firm.

During the negotiations, which spread over a week's period, operations were twice interrupted by brief "sitdowns" on the part of the workers; one for an hour and a half on Friday, Feb. 19, and another for part of Thursday, Feb. 25.

**New Interpretation Put
On Refrigerator Tax**

LOS ANGELES—Refrigeration Service, Inc., refrigeration parts wholesaler of this city, reports that local representatives of the Treasury Department are again conducting tax investigations on the books of West Coast dealers and service companies regarding payment of the federal excise tax on refrigerator manufacture, together with enforcement of new interpretations of the Federal Excise Tax Act defining remanufacture.

In August, 1935, this company reported that agents of the Collector of Internal Revenue were examining books of dealers in a drive to clear up collections of the 5% excise tax on household electric refrigerators.

According to Refrigeration Service, Inc., the revenue agents have begun another investigation, "this time enforcing some new interpretations of the Federal Excise Tax Act which, if attempted by any private group, would look suspiciously like racketeering."

"Now, the deputies in Los Angeles say that in addition to the tax imposed on component parts where a box has had either cabinet or com-

(Concluded on Page 9, Column 5)

**Flint Dealers Say 'Sitdown' Strikes
Were Worse Than the Depression**

Editor's Note: To find out the effect of a major strike on appliance sales, Staff Members Winfield Hughes, William H. Long, and Ross H. Potter last week journeyed to Flint, Mich., locale of the recent big General Motors strike, and interviewed appliance retailers of that city on the subject. What they found out is reported in the article starting below, and continued on pages 6, 8, and 9.

FLINT, Mich.—Branded by one of the city's oldest dealers as the "worst thing that has ever happened to business in this town—worse than anything that happened during the depression," sit-down strikes in Flint's vast Buick, Chevrolet, and Fisher Body plants have reduced a flourishing refrigeration and appliance business in a city of 165,000 to a virtual standstill, left deferred payment collections in the lurch, and have caused havoc in the operations of Flint's two score dealerships.

That the strikes have been officially declared at an end has but slight bearing on the situation, dealers concur in saying. Flint is preponderantly industrial, most of the workers are General Motors employees, and the great majority of refrigeration and appliance sales are on a time payment basis—which, naturally, depends on regular wage payments for successful collection.

During the strike, buyers spent their cash reserves, and the workers have only just returned to the factories, with debts accumulated during the layoff and still waiting to receive

their first substantial wage checks.

So, at the present, prospective purchasers are as scarce as the proverbial hen's teeth, those who have bought refrigerators are unable to meet their payments on schedule, and Flint dealers are faced with the ruins of what promised to be a banner spring selling campaign.

Some dealers, however, expressed the feeling that after the first payday following the strikes (coming up next week), business might revive somewhat.

Even extension of payments and utilization of attractive no-down-payment selling have failed to start the ball rolling again. Show floors remain empty. A total of about a dozen visitors looking at refrigerators were seen by three NEWS representatives during a day spent in visiting dealerships in the city.

To add to their difficulties, dealers state that, in their opinion, the strikes are by no means settled. They are almost unanimous in predicting that the renewal of plant operations will be interrupted by more disputes and possibly another "sit-downer" sooner or later.

One dealer, who has 18 years in Flint to back up his opinion, stated that workers who formerly earned \$45-\$56 per week have, since the strike, found themselves making only \$35 due to the union's agreement demands for shorter working days and spreading out of employment.

Despite the seriousness of the situation, Flint dealers are not facing

(Continued on Page 6, Column 1)

**'Quota Busters' Meet
In Annual Roundup**

MANSFIELD, March 1—From all parts of the country, from the big cities and the small hamlets, 150 "quota bustin'" Westinghouse refrigerator salesmen today headed into this city, headquarters of the Westinghouse refrigeration department, for their annual roundup.

For many of the "rangers" the trip will be the first they have won to the "main corral" in recognition of their sales achievements; for others, it will be a second or third trip, the mark of consistent sales performance.

(Continued on Page 13, Column 1)

**Bill Would End N. Y.
Utility Selling**

ALBANY, N. Y.—A legislative bill which would stop New York state public utilities from dealing in appliances has been introduced to the Assembly by Max M. Turshen of Brooklyn.

The proposed legislation is in the form of an amendment to the transportation and corporation law, and reads as follows:

"Nothing herein contained shall give a gas corporation and a gas and electric corporation the power to manufacture, sell, lease, or otherwise deal in any gas or electrical appliances for household use of any kind, nature, or description."

Increases and New Prices on 6 Makes of Refrigerators**Westinghouse**
(Detroit Installed Prices)

Model	Net Cu. Ft.	New Price	Amount of Increase
FDS 30	3.2	\$113.00	\$3.50
FDS 40	4.0	137.50	3.00
FDS 50	5.0	177.50	5.00
FDS 60	6.0	207.00	7.50
FDS 70	7.0	231.50	3.00
FD 50	5.0	192.00	9.50
FD 60	6.0	227.00	9.50
FD 70	7.0	251.00	7.50
FD 92	9.2	274.50	*
FPS 50	5.0	196.50	4.00
FPS 60	6.0	226.50	3.00
FPS 70	7.0	251.00	3.00
FP 92	9.2	294.50	*
EPX 135	13.5	529.70	3.80*
EPX 200	20.1	628.50	6.00*
FS 50	...	157.50	8.00
FS 60	...	177.50	8.00
FS 70	...	207.00	8.50

*No increase. †Decrease.

Frigidaire
(Detroit Retail Price)

Model	Net Cu. Ft.	New Price	Amount of Increase
D 337	3.1	\$113.00	\$6.50
DRS 537	5.1	157.50	9.00
DRS 637	6.2	177.00	9.00
DRS 737	7.2	207.00	10.00
Master 437	4.1	137.50	6.00
Master 537	5.1	177.00	7.50
Master 637	6.2	207.00	10.00
Master 737	7.2	231.50	10.00
Master 837	8.25	256.00	10.00
Deluxe 537	5.1	196.50	7.00
Deluxe 637	6.2	226.50	10.50
Deluxe 737	7.2	251.00	10.00
Deluxe 837	8.25	275.50	10.50
Imperial 37	13.5	393.50	8.50

*No increase. †Decrease.

General Electric
(Detroit Installed Prices)

Model	Net Cu. Ft.	New Price	Amount of Increase
B4-37	4.2	\$139.50	\$6.00
B5-37	5.2	179.50	7.50
B6-37	6.1	209.75	10.25
B7-37	7.1	234.75	9.25
B8-37	8.1	259.50	11.00
JB5-37	5.2	159.95	10.00
JB6-37	6.1	179.75	10.25
JB7-37	7.1	209.75	10.25
M6-37	6.2	212.50	10.00
M8-37	8.2	269.50	11.00
PB6-37	6.1	229.75	11.25
PB8-37	8.1	279.50	11.00
K-12	12.5	425.50	10.00
K-15	15.4	526.50	10.00

Hotpoint
(Suggested Installed and Delivered Price)

Model	Net Cu. Ft.	New Price	Amount of Increase
220EB21	2*	\$ 90.50	†
120EB31	3*	117.50	†
120EB51	5*	159.95	\$10.00
120EB61	6*	179.00	10.00
120EB71	7*	209.75	10.25
120EC41	4.2	139.50	6.00
120EC51	5.2	179.50	7.50
120EC61	6.1	209.75	10.25
120EC71	7.1	234.75	9.25
120EC81	8.1	259.50	11.00
110ED41	4.2	162.50	†
110ED51	5.2	199.50	†
110ED61	6.1	229.75	11.75
110ED81	8.1	279.50	11.00
110ED121	12.5	425.50	10.50
110ED151	15.4	526.50	10.00

*Approximate. †New model.

Kelvinator

Model	Net Cu. Ft.	New Price	Amount of Increase

</

Speakers Listed for Oil Burner Show At Philadelphia March 15 to 19

(Concluded from Page 1, Column 5) ager. More than 20 new members have joined the Institute in order to become eligible to participate in the show, Mr. Curtin declares.

Winter air conditioning will be featured, in order to capitalize on current public interest in this new development, the exposition manager says. Nearly one-half of the present list of exhibitors will show products applicable to that field.

Several prominent personalities in the air-conditioning industry will address trade and public meetings during the show week. Among them are Willis H. Carrier, chairman of the board of Carrier Corp.; J. R. Hertzler, sales manager of the air-conditioning division of York Ice Machinery Corp.; Elliott Harrington of the air-conditioning department of General Electric Co.; and J. K. Knighton of the air-conditioning de-

partment of Kelvinator division, Nash-Kelvinator Corp.

The Hertzler, Harrington, and Knighton speeches will be broadcast in special afternoon studio programs, although they will be delivered to the exposition at night.

A special program has also been planned for dealers, under the direction of K. S. Purdy and F. C. Haab. Mr. Purdy is a member of the executive committee of the Electrical Association of Philadelphia, and Mr. Haab is chairman of the group. Co-operating with them is E. P. Bailey, Oil Burner Institute regional director.

Three special dealer speakers have been secured: C. W. Whitney, president of ABC Oil Burner & Engineering Co., Inc., who will speak on "Service and Installation Control"; Dr. Herbert W. Hess, professor of marketing at University of Pennsylvania, whose topic will be "Modern

Merchandising"; and a third speaker to be announced.

These talks will occupy the morning of Mar. 18, following which is the dealer luncheon. Meetings will be held at the Benjamin Franklin hotel, convention headquarters.

Other figures in the electrical appliance and air-conditioning field who will address meetings during the exposition include W. J. Donald, manager director of National Electrical Manufacturers Association, and Dr. C. A. Mills, professor of experimental medicine at the University of Cincinnati, whose topic is "Health Angles of Winter Air Conditioning."

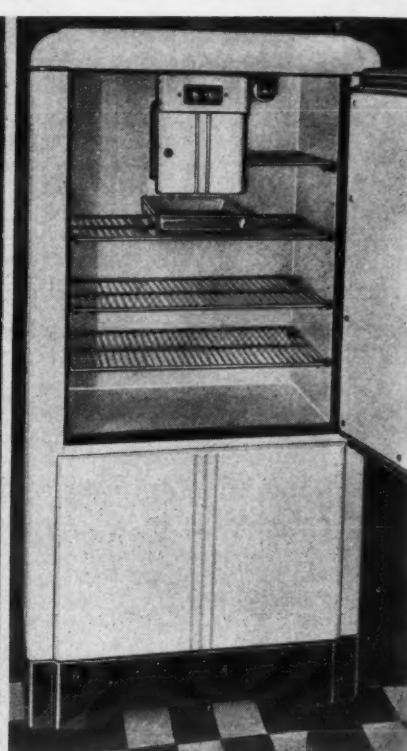
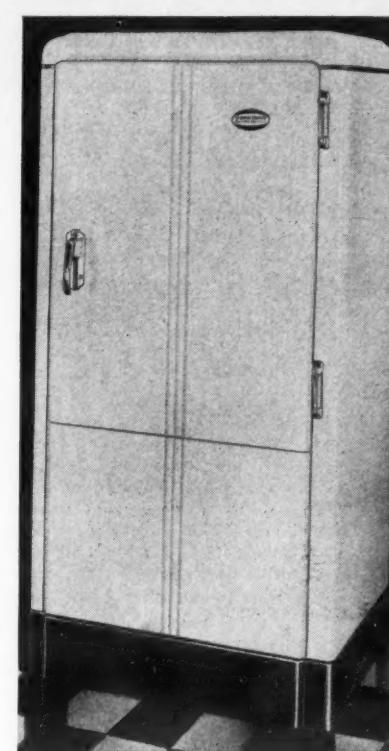
More than 7,000 invitations have been extended to dealers throughout the east, many of whom are expected to be in attendance all the week of the show, so Mr. Curtin and G. Harvey Porter, managing director of the Institute are looking for the largest dealer turnout in the history of the exposition.

This is the third time the show has been held in Philadelphia. Selection of the city at the present is particularly logical, OBI heads believe, since the city is the fourth largest oil heating market in the world, and has a saturation point of but 12%.

Besides, they point out, 213,957 of the city's homes are owner-occupied, in a territory of 379,853 homes. And there are 594,846 heating plants in the Philadelphia area—more than a half-million prospects, to their way of thinking.

Present oil burner ownership in the territory is 69,725, or about one unit to every eight and one-half heating plants—leaving 88% of the market to be touched.

Two Views of 1937 Zerozone



Key Specifications of 1937 Zerozones

Model	Capacity (Cu. Ft.)	Shelf Area (Sq. Ft.)	No of Trays	Ice Cubes	Lbs. of Ice	—Exterior Dimensions— Height Width Depth
W-437	4.12	9.48	2	56	4½	52¾ 24¾ 24¾
W-537	5.20	10.00	2	84	6	56½ 24¾ 24¾
W-637	6.30	11.20	2	84	6	58¾ 29 24¾
W-837	7.62	16.45	3	112	8½	63¾ 31¾ 25¾

Zerozone Features New Styling in 4-Model Line

(Concluded from Page 1, Column 1) minor mechanical refinements in compressor construction. A set of three vertical striations running the full length of the front of the cabinet is a new Zerozone style feature, together with a narrow chromium band around the top and a redesigned nameplate located at the top right-hand corner of the door.

Cabinet exteriors are finished in Dulux with acid-resisting porcelain interiors in all four models. Satin-finish hardware of the semi-concealed type with brighter chromium hi-lites has been introduced this year. Cabinet bottoms are finished in black Dulux and are arched closer to the floor than in the 1936 series.

The Zerozone compressor of twin-cylinder construction has been continued. Evaporators are the Humidi-Pack type made by Peerless of America, Inc., and are fitted in the rear with a triple-fin arrangement to provide rapid heat transfer, but with proper air circulation. Delco, Emerson, or Wagner motors of $\frac{1}{6}$ hp. are used on the W-437, W-537, and W-637 models, with a $\frac{1}{6}$ -hp. motor of the same makes on the 8-cu. ft. box. Methyl chloride refrigerant is used in all units. Cutler-Hammer automatic temperature controls are standard.

Net capacities and shelf areas have been increased in the new line. Shelf arrangements have been redesigned to include more storage space for a greater variety of food products.

All ice trays are of the fast-freezing type, with one Flexo-Tray rubber grid standard in each model.

Fedders Introduces Line of All-Season Air Conditioners

(Concluded from Page 1, Column 5) and compact size per unit of capacity, all-copper heat transfer surface, easy accessibility of entire interior of cabinet, interchangeability of parts for either floor or ceiling mounting, and rust-proof construction throughout.

Direct expansion coils are equipped with Fedders high-capacity thermostatic expansion valves located on manifolds, and providing easy adjustment and accurate refrigerant control in accordance with varying temperature differentials encountered as air progresses through coil.

It is said that blowers are of the centrifugal type operating at quiet speeds. Blowers are arranged for V-belt drive by any type of standard motor to suit local current characteristics.

Humidification is accomplished by

self-cleaning, atomizing spray nozzles, discharging into the air stream. Humidification may be controlled either manually or automatically. Sprays may be omitted if desired, and may be installed at a later time.

Aim in designing the manifolds was to obtain correct refrigerant distribution, as well as economy of space occupied. Manifolds are very accessible, and convenient for making piping connections, as they are located outside the cabinets.

Filter sections contain double removable filters, and are provided with removable plates for access to filters.

CONDENSERS
DOMESTIC EVAPORATORS
COMMERCIAL EVAPORATORS
AIR CONDITIONING SURFACE

MCCORD
REFRIGERATION AND
AIR CONDITIONING
Products

BLAST HEATING SURFACE
COMFORT COOLERS
MARKET COOLERS
UNIT HEATERS

CATALOGUES ON
REQUEST

MCCORD RADIATOR & MFG. CO.
DETROIT, MICHIGAN

COMMONWEALTH FITTINGS

Built Right to Stay Tight
COMMONWEALTH BRASS CORPORATION
COMMONWEALTH ALUMINUM AND CYLINDRICAL
DETROIT

TWO NEW AMMONIA VALVES —TYPE "TFL" AND "TGS"

● Providing greater accuracy of control and tighter seating than any valve previously made for ammonia. Alco types "TFL" and "TGS" thermo valves are setting new standards in refrigerant control, eliminating numerous costly replacements, service calls and adjustments.

The simplicity of design has reduced friction to a minimum, making possible true throttling action. Pins and seats of a special alloy—machined to a new degree of accuracy, combat erosion and assure a tighter seating valve. All working parts built into one replaceable cage assembly. Self-contained filters of more than adequate capacity, easily cleaned, make servicing easy.

Both valves are light in weight, small in size, and are applicable to any type or style of low side evaporator. Type "TFL" valve is especially adaptable to show case, fixtures or truck installation where space is at a premium.

For complete details ask for bulletin No. 148.

ALCO VALVE CO., INC.
2628 Big Bend Boulevard, ST. LOUIS, MISSOURI

part of Kelvinator division, Nash-Kelvinator Corp.

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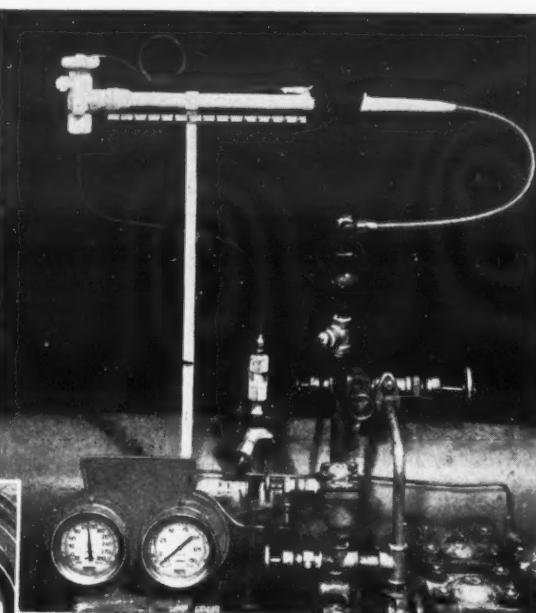


"Don't get the idea, young man, that you are the one who sold me a Copeland. I asked five or six other druggists who have Copelands, and THEY are the ones who convinced me."

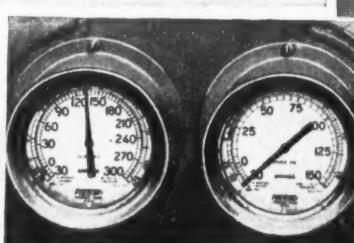
Write for our Sales Plan

COPELAND

REFRIGERATION CORPORATION . . . DETROIT, MICHIGAN

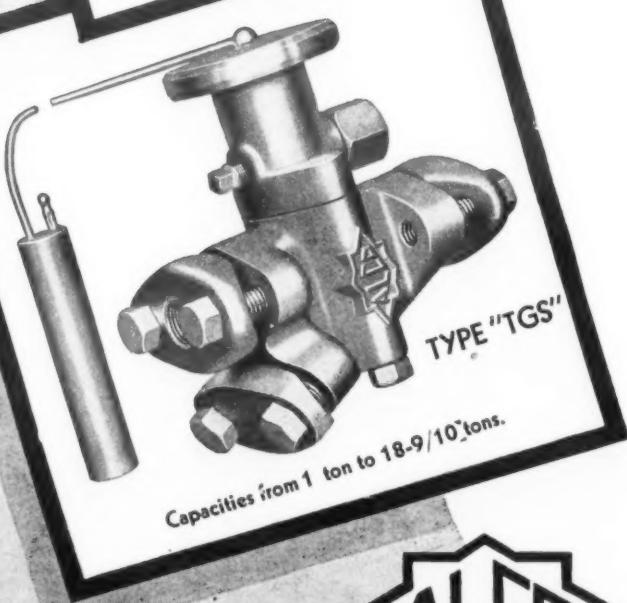


The Type "TFL" on the two-ton Compressor shown above, held the line of complete evaporation at the remote bulb, fourteen inches from the valve. The six inches of frost beyond the bulb was due to the natural conductivity of the tubing.



TYPE "TFL"

Capacities from 1 ton to 2-1/10 tons.



TYPE "TGS"

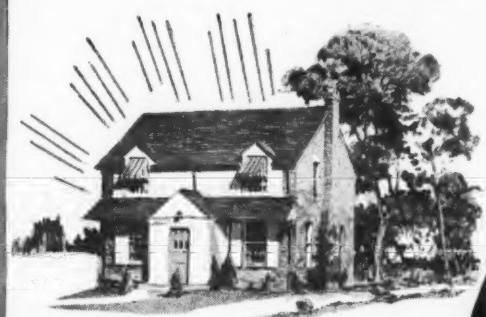
Capacities from 1 ton to 18-9/10 tons.



Known
wherever refrigerants
are controlled

Kelvinator goes on the air

March 6TH!



A NEW KELVIN HOME

The first prize in Kelvinator's Big Radio Contest will be a Kelvin Home, complete with year 'round air conditioning, electric or gas range, electric refrigerator, constant hot water, electric laundry equipment. The last word in modern living!

Half-hour Program

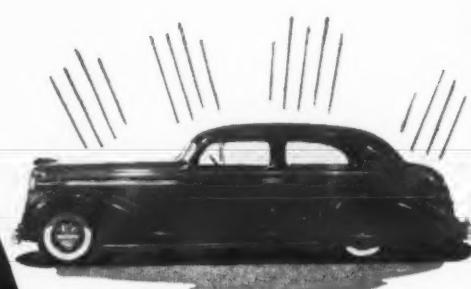
SATURDAY EVENINGS AT 8:00 E.S.T.

COAST TO COAST HOOK-UP OF
55 STATIONS ON THE COLUMBIA CHAIN

TWO BIG CONTESTS

FIRST PRIZE—A KELVIN HOME

AND MORE THAN A THOUSAND OTHER PRIZES
INCLUDING NASH CARS • REFRIGERATORS
• ELECTRIC AND GAS RANGES •
WASHING MACHINES • ELECTRIC
IRONERS • AND CASH



A NASH AUTOMOBILE

Included in the other prizes will be completely equipped Nash cars—one of the country's finest and most beautiful automobiles. Big, roomy, perfectly appointed automobiles, that anyone would be proud to win and drive.

A program built to produce FLOOR TRAFFIC

Kelvinator will not only have a thrilling program that will appeal instantly to everyone, but will have two big contests that will bring people in great numbers to the stores of Kelvinator dealers.

The contests are fascinating and yet so simple that anyone can enter with a real chance of winning. There is nothing to buy—no tiresome essays to write, but every contestant must visit a Kelvinator dealer in order to secure entry blanks and rules of the contests. This means Floor

Traffic for Kelvinator dealers—and because of the nature of the contests, it will mean floor traffic composed of men and women who will be anxious to learn all they can about Kelvinator appliances for their homes.

And this radio campaign with its Two Big Contests is only one of the many sales promotion features of the 1937 Program. Only one of the things which is going to make 1937 the greatest year in history for Kelvinator dealers and salesmen.

KELVINATOR • DIVISION OF NASH-KELVINATOR CORPORATION
DETROIT, MICHIGAN

Kelvinator

ELECTRIC REFRIGERATORS • RANGES • WASHING MACHINES • IRONERS • AIR CONDITIONING EQUIPMENT

With Universal Cooler



JOHN L. BURTON
Directs contract sales of household refrigerators.

Crosley N.Y. Distributor Devises New Type Dealer Contract

(Concluded from Page 1, Column 5)

The distributor, on the other hand, agrees to sell merchandise to the dealer at prices then effective in New York State, and to pay cash for merchandise repurchased upon termination of the agreement.

Complete terms of the agreement follow:

"1. This agreement shall be in effect during the remainder of the year 1937.

"2. Dealer agrees that his franchise for Crosley merchandise covers its resale to consumers only, and does not authorize resale for export beyond the limits of the United States, nor to any other dealer within the United States. The dealer agrees to adhere to sales policies outlined by the distributor, and to cooperate with the distributor to promote public acceptance of Crosley merchandise.

"3. Dealer agrees to maintain an adequate number of Crosley samples in all of his retail outlets throughout the period of this agreement, and to promote the sale of Crosley products during the entire period.

"4. Dealer agrees that his sales organization will receive as much compensation, regardless of its

source, for the sale of Crosley products as for any competitive products of similar resale price, excepting repossession and floor samples.

"5. Dealer agrees that on advertising of any type whatsoever distributor will be responsible for no part of the cost of such advertising unless the dealer has written approval signed by duly authorized representative of distributing corporation.

"6. Dealer agrees to purchase from distributor throughout the term of this agreement an adequate supply of display material, window cards, and sales promotion helps and circulars in order to adequately promote the sale of Crosley merchandise.

"7. With reference to sales by distributor to dealer within the State of New York, distributor agrees to make these sales from time to time at the prices then effective in New York State, and dealer agrees not to advertise, offer for sale, or sell within the State of New York any Crosley products at prices less than the prices stipulated by distributor now in effect and as announced from time to time.

"8. Dealer agrees to maintain the selling price of the Crosley products as fixed by distributor from time to time. Dealer further agrees to give no rebate or refund or any other inducement or concession in connection with the sale of Crosley products which would directly or indirectly offset or reduce the selling price of such products.

"9. This agreement may be terminated by either party at any time by notice in writing mailed to the other, and if so terminated, the distributor shall not be liable or obligated in any manner whatsoever by reason of such cancellation or termination, but shall have the right to purchase from dealer any and all merchandise heretofore purchased from the distributor and not sold, at the prices paid by dealer to distributor or the current net price, whichever distributor elects to pay. It is further agreed that distributor will make cash payment for all merchandise delivered in accordance with the terms of this paragraph after dealer has given distributor a reasonable opportunity to inspect the merchandise before repurchase.

"10. If dealer refuses to resell such merchandise, distributor shall be entitled to injunction relief, preventing dealer from disposing of it in any manner whatsoever to any person, firm, or corporation, and in addition

thereto, the parties agree that the dealer shall pay as liquidated damages and not as a penalty, the sum of fifty dollars (\$50) for each Salvador remaining in his or its possession and which he has refused to resell under the terms hereof."

Maker of Air Purifier Agrees Not To Call It a 'Conditioner'

(Concluded from Page 1, Column 1) device of the temperature, humidity, and circulation of the air in rooms, buildings, and railroad passenger trains; and the non-performance of any one or more of these functions takes a device out of the class of air conditioners, according to the understanding of the trade and the purchasing public."

The Gaylord Mfg. Co. manufactures a so-called air refining device under the trade name, "Fresh'nd-Aire." The commission stated that use in advertising of the words "air conditioning," either alone or in connection with the words "system," "unit," or "features," so as to imply that the device is capable of performing air conditioning, will be discontinued, as will the use in advertising of the word "sterilizes" so as to imply that the device actually destroys all germs within the space in which it operates.

In the Gaylord stipulation, known as FTC stipulation No. 1883, in Bulletin No. 1210 of the National Better Business Bureau, Inc., the Gaylord device is described as "a multiple-speed fan, having a so-called 'purifying' attachment composed of two electric heating devices which vaporize chemicals that are intro-

duced into the air current by the circulator, the chemicals consisting of chlorine and formaldehyde, whose strong odor is neutralized by perfume."

William B. Henderson, executive vice president of the Air Conditioning Manufacturers Association of Washington, D. C., stated in regard to the Federal Trade Commission's ruling:

"In addition to the definite policy of the Federal Trade Commission, the National Better Business Bureau requests the cooperation by all interested in fair advertising in the elimination of the term 'air conditioning,' or 'air conditioner,' or 'air conditioned' to describe such articles as fans, humidifiers, odor absorbers, underwear, hats, and so on."

Retail Furniture & Appliance Sales Up 25% in '36

WASHINGTON, D. C.—Retail sales of furniture and household appliances for 1936 show a gain of 25% over those of 1935, according to figures compiled by Nelson A. Miller, chief of the retail trade section, marketing research division, Bureau of Foreign and Domestic Commerce.

Except for sales of lumber, building materials, and hardware, which increased 27%, the furniture and household appliance group led all other classifications in the upward trend, with the automotive group only 1% behind.

The all-time high in retail sales of furniture and household appliances was set in 1929, when the total volume reached \$2,755,000,000. Sales volume in 1936 is estimated at \$1,613,000,000, an amount only 59% of the peak set in

1929 but approximately equal to that of 1931.

Low point was reached in 1932, when sales amounted to an estimated \$895,000,000. Since that time the up-swing has been sharp and steady.

Total sales of all the census classifications in 1936 are set at \$37,940,000,000, or 77% of the \$49,115,000,000 figure for 1929. Low-point year was 1933, total sales amounting to \$25,037,000.

Of the total retail sales for 1936, those of the furniture and household appliance group represent only 4.3%. The food group has the greatest proportion of the total with 23.7%, or \$37,940,000,000.

General trend in retail trade, downward during the depression to 1933 and upward during the recovery, logically follows similar trends in farm income and factory payrolls, showing the dependence of retail trade on agricultural and industrial conditions. Home building and related activities have also shown a remarkable influence on retail sales, particularly in the furniture and household appliance and the lumber, building, and hardware groups.

Notable among factors contributing to the 1936 gain in retail trade were the payment of the soldiers' bonus during the summer of that year and the widespread payment of wage increases, bonuses, and dividends during November and December. It is expected that the latter payments, coming so close to the end of the year, will have a much greater influence in the retail trade of 1937.

Eating and drinking places, potential markets for commercial refrigeration and air-conditioning equipment, reached a new high in sales during 1936, surpassing the previous peak set in 1935 by an additional 14% and topping 1929 by 27%. The 1936 volume of sales was \$2,702,000,000. Those of 1935 and 1929 were \$2,391,000 and \$2,125,000,000 respectively.



REFRIGERATOR INSULATION has everything . . . its name is BALSAM-WOOL

• There is a good reason why Balsam-Wool Fibre Slabs are used by more manufacturers of domestic refrigerators than any other insulation. Balsam-Wool is the one insulation that has everything. It is highly efficient. It is sealed against moisture. It is non-settling. It is clean—made from wood fibres.

In addition, Balsam-Wool is an economical insulation for the cabinet manufacturer to use. He can make Balsam-Wool Fibre Slabs on licensed machines in his own plant—thus substantially reducing overhead. He can thus, also, have exactly the sizes of Balsam-Wool Fibre Slabs that he needs.

Let us give you complete information about Balsam-Wool Fibre Slabs—let us show you why they are a better insulation for YOU to use. Complete facts are yours for the asking.

WOOD CONVERSION COMPANY

Refrigeration Sales Division • 360 N. Michigan Ave., Chicago, Ill.

St. Paul, Minn. • New York, N. Y.

BALSAM-WOOL
FIBRE 
SLABS

PRODUCT OF

Demonstrate the JEWETT alongside any other refrigerator



Prove to your prospects
the Jewett Humidifier
keeps fresh vegetables
40% fresher.

The Jewett has everything that
every one looks for in a refrigerator
of outstanding quality. And
in addition it features the
exclusive Humidifier Compartment
that keeps fresh vegetables 40%
fresher. By comparison, by demon-
stration the Jewett can get
the business for you in the
toughest competitive market.
Write or wire for the facts and
exclusive franchise proposition.

THE JEWETT REFRIGERATOR
CO., INC., BUFFALO, NEW YORK

Established 1849

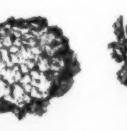
Consider these almost unbelievable results



Celery, by weight,
lost 2% in Hu-
midifier Compart-
ment—in regular
compartment 63%.
A difference of
61%.



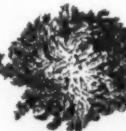
Lettuce, by weight,
lost 4% in Hu-
midifier Compart-
ment—in regular
compartment 27%.
A difference of 23%.



Cauliflower, by
weight, lost 4½%
in Humidifier Compart-
ment—in regular
compartment 27½%.
Difference of 23%.



Parsley, by weight,
lost 2% in Hu-
midifier Compart-
ment—in regular
compartment 27½%.
Difference of 25%.



Endive, by weight,
lost 1½% in Hu-
midifier—in regu-
lar compartment 40%.
Difference of 38½%.

J E W E T T

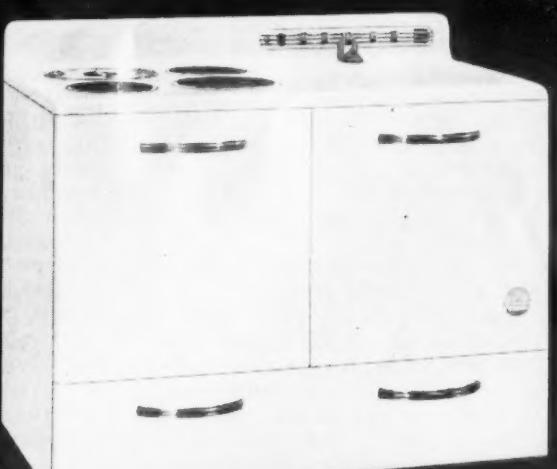
America is Ready— FOR THE ELECTRIC RANGE!



MODEL ER-60



MODEL ER-70



MODEL ER-50



MODEL ER-40



MODEL ER-20



MODEL ER-30



MODEL ER-10

and KELVINATOR IS READY
with everything you need
to cash in on the demand

There is no doubt that the electric range is now entering the period of mass-market sales and large profits for dealers. The pioneering and development periods are over. America is ready for the electric range—in fact more than two million American housewives already are cooking with electricity.

Kelvinator also is ready. Kelvinator is definitely in the electric range business . . . Kelvinator has created a specialized Electric Range Sales and Merchandising Division . . . It has perfected a line of ranges unexcelled in beauty, performance and economy . . . It has invested heavily in research, tools and dies . . . In 1937 it is placing a dominating national magazine and radio campaign behind the products . . . It has developed promotional plans and selling materials which insure the success of its dealers in this field.

Why not get in touch with your Kelvinator distributor and get all the facts concerning the profit possibilities for you with Kelvinator Electric Ranges. Do it now.

KELVINATOR, Division of Nash-Kelvinator Corporation—Detroit, Mich.

THE PROGRAM BEHIND KELVINATOR ELECTRIC RANGES. Your Kelvinator distributor will be glad to show you in detail Kelvinator's Big Program for 1937. It includes national magazine and radio advertising; local advertising; sales promotion; displays and selling literature. The program is complete and it will be effective.



COMPLETE SELLING PLANS FOR YOU
At the left are shown only a few of the many selling helps which will be given to Kelvinator electric range retailers. As a Kelvinator retailer you will have everything you need to be a successful dealer right from the start. See your distributor now and get in on the "ground floor."

Kelvinator ELECTRIC RANGES

CUT THE COST OF BETTER LIVING

Baltimore Show to Feature Appliances & Conditioning

BALTIMORE — Electric refrigerators, appliances, model kitchen equipment groups, and air-conditioning units will be included in the exhibits featured at the Second Annual Baltimore National Home Show, to be held in the Fifth Regiment Armory here April 3-10, under the auspices of the city real estate board, in cooperation with the FHA and the Manufacturers Housing Promotion Council.

According to Henry A. Guthrie, managing director of the show, all leading electric refrigerator distributors, department stores carrying appliances, and the Baltimore Gas & Electric Co. will have refrigeration

and appliance displays at the show, and several air-conditioning distributors have also booked space.

Some distributors have taken from three to seven booths in which to display refrigerators, appliances, radios, and complete kitchen equipment, he states.

Electromaster Reports 68% Business Increase in 1936

DETROIT — Electromaster, Inc., electric range and water heater manufacturer here, reports an increase of 68% in the number of units shipped during 1936 as compared with its total shipments for 1935.

In announcing the increase, Richard B. Marshall, president, stated 1936 the best in the company's history.

Kneer, Inc., to Move to New Building April 1st

HARRISBURG, Pa.—Kneer, Inc., Gibson electric refrigerator distributor here, will move to new larger quarters in the three-story brick building at 317 S. Cameron St. April 1, according to C. G. Kneer, head of the concern.

In its new location Kneer, Inc. will be in the center of the city's wholesale district.

The building into which the company will move is being completely renovated and modernized, and will contain a large display room and warehousing space. Parking space will be provided in the rear of the building.

one year over to the finance company. Long terms didn't seem to make any difference during the strike, he shrugged. There wasn't any money. People just didn't buy.

"The worst of it is," he said, "we don't know that the thing is settled. Neither do the workmen. And until they do, it's a cinch they aren't going to buy appliances. Another sitdown started just the other day in one of the Chevrolet plants," the serviceman illustrated. "Only a few sat down. They were thrown out. Still—"

Meanwhile Mr. Cusson is looking for a salesman. The last one they had wasn't reliable. They had to get rid of him. That was two years ago.

"He wasn't reliable," he protested again.

Dealer Tells Why Radio 'Spots' Were Effective

The Clyde Hall Radio Shop, selling Gibson, Kelvinator, and Stewart-Warner, is across the way from four of the Flint Chevrolet plants.

"Business is still going slowly," said Dorheyn Root, credit manager of the store, pinch-hitting for Mr. Hall.

"Tomorrow is their first pay day. You can't expect much before then. But we're getting ready for things next week. New shipments for two of our lines will be coming in—and on new lineups."

"Kelvinator is just coming now because they've been held up, of course. Stewart-Warner wasn't held up, but with business shut down as it has been we didn't see any use in rushing stock through."

Clyde Hall's bids solely for the market across the way—the Chevrolet workmen, Mr. Root explained. Time payments run up to three years. The store handles contracts up to eight months duration; those longer go to the finance company.

There were signs in the shops along the street: "Back to Work Sale" . . . "No Down Payments" . . . "No Payments till 30 Days."

"Most of them had the same terms before the strike," Mr. Root assured us. "It's just good psychology to play it up now. We haven't made any changes in time payments. Special terms don't make any difference when men aren't working."

"What we are going to do is clean out our complete 1936 stock early next week. We'll play it up over the radio—we have a regular 15-minute spot on the daily programs. We've found radio easily the best advertising for reaching the market we want to reach—the men over there," he nodded. "It's a specialized market, one that all the newspapers together wouldn't get to. But radio does."

"Most of them come from the border states—Missouri, Oklahoma, Arkansas," he continued. "And they like mountain music. Our spot on the radio last year came just before the 6:00 o'clock baseball scores, and we found it very effective. We're right here when they come out with their pay envelopes—right in sight. And once they buy it's very seldom they renege on payments. Our repossession have averaged less than 4%."

Just at that moment Jack Happy of Station WFDF, Flint, came in with a script for the store's opening program. Mr. Hall hadn't come in yet, and Mr. Happy gave us a few sidelights on what refrigeration is doing on the radio.

"The radio idea is still growing in

Flint," he reviewed. "The Palmer store, across the city, uses broadcasting in his setup. Of course, he appeals to a different market, and uses a different type of program than Clyde Hall."

"The Buick plant is over there, and the class of workers is different. A lot of them have been there, working for Buick, for 25 years or more. They own their own homes, they bank more money—they need a different kind of sales approach."

"One downtown Kelvinator store uses a Lost and Found broadcast," he illustrated. "People call in, and the notice goes out over the air free. That's another kind of publicity—it draws attention and gives a service at the same time. There's a Norge dealer in town who turns his program directly toward the housewife. Recipes, cooking methods, party plans—but he's just making the most of the complete line of kitchen appliances that he sells."

"This store has a setup all its own. The biggest percentage of the men across the way come from the Ozark country. And they do the buying in their families."

"We've tried everything in the way of a radio program to reach them—dance music, sport news, play-by-play broadcasts of the games. But it turned out to be hillbilly music that brought them in every time. And that's what the program is going to be this year, taken from the studio's library of hillbilly records."

"Flint's a good money town," he generalized. "Especially with respect to refrigeration sales. I've met engineers who'd rather stay here as salesmen than go on with engineering someplace else. Dealers here sometimes average from 40 to 70 refrigerators a week. The whole town is industrial, and when business is good it's very good."

Mr. Hall appeared on the scene. "Business is settling down again," he judged. "Things are still restless. (Continued on Page 8, Column 1)



FAN-E-FEX

The Forced Draft Unit cooler suitable for a wide variety of applications.

Compact design eliminates construction of costly space-wasting bunkers and baffles in storage rooms.

Temperature uniformity, controlled humidity, eliminating of sweating of walls and ceilings, and maintenance of sanitary conditions in storage rooms are distinct advantages of Fan-E-Fex forced draft circulation.

Fan-E-Fex will be supplied for use with any refrigerant specified.

REFRIGERATION APPLIANCES, INC.
FIN COILS, UNIT COOLERS
AIR CONDITIONING UNITS
923 WEST LAKE STREET • CHICAGO

This simple patent is the secret that has made

a SILENT V-BELT

... and here's the reason



When a straight-sided V-belt bends around its pulley there is tension on the top of the belt and compression on the bottom. This makes the side walls bulge outward—as shown in figure 1, below.

The Gates Belt is built with a patented concave side. The bulge, due to bending, simply stretches the concave side to a precise fit with the sheave groove as shown in figure 2.

This exact fit naturally prevents slipping. No slipping means a SILENT belt, a belt that wears longer, a belt that does not heat and therefore does not stretch.

BELT GUIDE — FREE
The Gates Belt Guide is the recognized national authority on correct belt fit for ALL Refrigerators, Wash. Machines, Pumps, Stokers, etc., etc. FREE from your Jobber or the GATES RUBBER CO., Denver, Colorado.

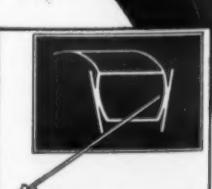


Figure 1

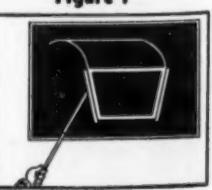


Figure 2

Write Today!

GATES BELTS

- WHAT DEALERS ARE SAYING & DOING -

Strike Forced 'Rewriting' of Contracts On Time Payments by Flint Dealers

(Concluded from Page 1, Column 3)
the future with apathy. Salesmen are working at top speed to line up new prospects and every effort is being made to defer payments on time contracts to aid purchasers who already have boxes in their homes. Of the 20 dealers interviewed, all were apparently digging in for a long, hard battle against sales resistance and lack of ready purchasing money.

Consumers' Power Co.'s large floor, displaying about 20 models of the 1937 Frigidaire, was almost bare of activity. H. W. Courville, superintendent of appliance sales, said that the utility had extended pay-

ments on boxes already bought and felt that sales would approach normal as soon as workers' salary checks rolled in again. He stated, however, that the strikes had disrupted expectations for spring selling and had postponed normal operations for about two months. Consumers' position as the largest refrigeration and appliance dealer in the city is not as materially affected as that of the smaller dealerships.

At George W. Hubbard Hardware Co., Westinghouse, Sales Manager C. E. Brown reported that the firm handled all its own time paper and had extended contracts payments to

suit the convenience of owners. During the strike, said Mr. Brown, collections were at a standstill, but Hubbard's were not worried about future payments from their clientele.

J. E. Spielmaker, manager of the Good Housekeeping Shop, a Kelvinator, G-E, and Hotpoint outlet, told us that General Motors employees will not receive their first full-rate pay checks until Friday, March 5—consequently, they are not on the market for refrigerators as yet. This dealership's collections were only about 33% of normal during the strike, and business since has been far from 1936 standards.

Frank F. Farwell, president of the Farwell Sales Co., reported that his Kelvinator-Leonard business, averaging \$5,000-\$8,000 per month last year, had fallen off to \$700 in January of this year and would only total about \$300 for February. Payments have been deferred as long as owners retain their jobs, he said, but new business is practically nil. Many Farwell customers have come in to report that they are hard put to meet debt obligations incurred before the strike and bills accumulated during suspension of operations in the plants.

F. W. Boswell, owner of Boswell-Maytag Co., which handles Leonard, Norge, and Stewart-Warner refrigerators besides an extensive appliance line, stated: "Business hasn't gone forward as it used to after seasonal layoffs in the automobile plants. In most cases, we rewrote time payment contracts and granted extension of time. Before the strikes, we arranged for the first payment to fall due in April, but now we have decided to let people pay out of their second or third salary check after they resume work."

Mr. Boswell characterized the present situation as more serious than any encountered during the depression years.

At the B. D. Malcolm Music Co., which sells Norge, Leonard, Crosley, and Stewart-Warner refrigerators, three-quarters of normal spring deals have been held up by the strikes, said Roy C. Martin, manager.

Mr. Martin reported prospects reluctant to enter long-term contractual obligations under present uncertain conditions. Most workers, he said, have kept their Christmas bonuses or used them up to meet bills during the layoff. Malcolm's have deferred time payment collections until owners can meet them.

Service Business Improved During Strike Period

Radio servicing rose sharply throughout the period of the strike in Flint; so did refrigeration servicing, said Joseph U. Cusson of the Cusson Radio & Electric Shop, Flint.

"I service them, and I know," he stated simply. "My dad and I are partners here; he handles the selling.

"All the while the strike was on these flash reports kept coming in on the programs. It got so they'd come in anywhere. People kept their radios on all the time to catch them. Servicing calls went way up. While I'd be catching up on a radio they'd think of the refrigerator. I'd look that over, too."

But now that the strike is over, servicing has faded too, was his report.

"And of course we haven't sold a doggone box since the strike began. But we've got in a new line—Crosley. When the money starts, we'll have that plus the full Westinghouse line. These are all workmen's homes around here, and sections like this will feel the comeback first."

In normal times the 6 and 7-cu. ft. boxes are best sellers, he estimated. The firm grants time contracts up to three years, but turns all those over

WOLVERINE TUBING ... product of Craftsmanship

If you've ever had an urge to make things with your hands, you'll instantly understand why Craftsmanship does exist, even in a Machine Age.

Before machines became what they now are, plenty of Craftsmen could be found. They lived mainly to see finer things produced through their own skill. But where do such men have a chance to put their individual stamp on every piece of work that passes their way? Where can such a man, using machinery as an aid rather than an obstacle, employ this ability to give a definitely greater value to a product—a value not to be had with impersonal machinery alone.

Such a place is the Wolverine Tube Mill. Here, operations are carried on with the idea that the quality rather than quantity produced is important. Every operation is completed with such care and attention that the uncommon quality of Wolverine Tubing and its uniformity in high quality, is most often referred to as being a "Product of Craftsmanship."

Because Wolverine Copper Tubing is a product of Craftsmanship you are assured of quality. Made from 99.9% pure electrolytic copper in accordance with A.S.T.M. Specification B68-33, it is soft, seamless, thoroughly deoxidized and dehydrated.

Your jobber also carries Wolverine Copper Tube (types K. L. & M.) for air conditioning.

WOLVERINE TUBE COMPANY
1411 Central Avenue • Detroit, Michigan

**Seeger
PRICE LEADER "THIRTY"**

The most sensational sales producer of the decade. This New, Low Priced Cabinet by Seeger, outstanding from every point of view, has a ready market in thousands of small stores and eating houses throughout the entire country. From coast to coast—Hamburger—Red Hot-Bar-B-Cue Stands and Lobster Shacks, will now be able to own a first class Seeger-Made Cabinet, at a price they can afford to pay.

Seeger Price Leader "Thirty" is built for self-contained Electric Refrigeration and Conditioned Air. It has everything—all-steel cabinet—adjustable shelves—Tylec door trim—Dulux Finish—extra fine chrome hardware—solid steel Dulux finish or Glass Doors.

LIST PRICES:

Seeger 30 - \$275.00 Seeger 30G - \$300.00
6-Door Model in this type is Seeger 53

Compare these prices and don't miss the opportunity of many sales and big profits.

**SEEEGER
REFRIGERATOR CO.**
Saint Paul, Minnesota
New York — Boston — Chicago — Los Angeles
San Francisco
Special Representatives:
Seeger-Philadelphia, Inc.
Philadelphia, Pa.
Meyers Smith Company
Buffalo, N.Y.

We regret to state that September 25th is the earliest date shipment of new orders can be assured, as the two original production orders, and over half of the third, are completely sold out.

ACTION!

This Seeger advertisement appeared in Air Conditioning & Refrigeration News Sept. 9.

Electrical Industries, Ltd., Cape Town, South Africa, sold seven cabinets, bought two more for stock, entirely from the News advertisement.

ELECTRICAL INDUSTRIES (PTY) LTD.
ELECTRICAL & REFRIGERATION ENGINEERS
TELEGRAMS: "CAPEBAT."
CORNER CASTLE AND
BUITENGRAFT STREETS,
CAPE TOWN
Messrs Seeger Refrigerator Co.,
SAINT PAUL, MINNESOTA, U.S.A.
7th January 1937

Dear Sir,

No. 30 CABINETS.
This will serve to confirm our cabled order this week for—
9 only Seeger No. 30 Cabinets.
which, according to your cable, you can ship by January 15th. This augmented order is intended to replace the original order for two cabinets cabled last week.

For your information, seven of these cabinets are intended for the new large Cape Town General Hospital, at Groote Schuur, the remaining two cabinets being for our stock.

In order that we may keep in touch, and automatically receive your latest catalogues and price lists, we should be pleased if you would have our name placed upon your catalogue mailing list immediately. It was just by chance that, noting your announcement of this new cabinet, Board immediately, and close the business.

As cabled, and unless otherwise stated, we would always prefer to do business by means of sight draft through Barclays Bank, Strand Street, Cape Town. Sometimes we may arrange to have the

If you want a refrigerator—buy a KELVINATOR
continued...
Messrs Seeger Refrigerator Co. 7th January 1937
Electrical Industries (PTY) Ltd.

Orders placed through the Fenchurch Export Corporation if this suits us at the time. In this case, you would receive your instructions from them, and not from us direct.

If you require references to cover any future business, we would refer you to Kelvinator Corporation, American Beach Corp; D. C. Andrews; Fenchurch Export Corporation.

Please note that our cable address is "Capebat", although in this instance we used the words "Electrical Industries" to avoid any misunderstanding on your side.

Thanking you for your attention to these several points.

We are,

Yours faithfully,
John H. Bill
DIRECTOR
ELECTRICAL INDUSTRIES (PTY) LTD.

Foreign markets are now active!

The incident of a 48-inch advertisement in the NEWS selling nine 30-cu. ft. commercial cabinets on a single order in South Africa is but an indication of the activity in foreign markets today.

Foreign buyers are hungry for air conditioning and refrigeration information, for specifications and detailed data, for prices, for equipment of all kinds. They are looking for sources of supply.

This is reflected not only in the response from abroad to advertisements appearing in the NEWS but also in letters received by the NEWS from foreign subscribers. Excerpts:

"---- put us in touch with refrigerator manufacturers of repute with view of representing them in South Africa."

"---- we are interested in securing the representation of American manufacturers of refrigeration parts and accessories." (Mexico)

"---- send us a list of the manufacturers who carry room coolers." (Java)

In response to this world-wide demand, the NEWS in its weekly issues publishes the information deemed to be most helpful to its readers both at home and abroad.

As an added and extended service to the entire industry, the publishers of the NEWS now plan to blanket the entire market, both domestic and foreign, with the 1937 MASTER CATALOG (The Red Book) which will be sent free to all important buyers throughout the industry. It is estimated that 50,000 copies will be required to meet the demand.

The 1937 MASTER CATALOG will serve as an effective connecting link between those seeking new and additional sales outlets and those looking for new and better sources of supply. It offers manufacturers an economical method of placing their catalog material in the hands of active buyers not only in America but also in foreign markets. Write for complete information.

AIR CONDITIONING AND REFRIGERATION NEWS

Business News Publishing Co., 5229 Cass Ave., Detroit, Michigan

New York Representative
JOHN B. GALLAGHER CO., INC.,
11 West 42nd St., New York, N. Y.
Pennsylvania 6-1280

Chicago Representative
LEWIS & NOELLE
612 N. Michigan Ave., Chicago, Ill.
Superior 8566

Sacramento Dealers Put on Cooperative Campaign

SACRAMENTO, Calif.—To stimulate electric refrigerator sales, electrical dealers here recently ran a cooperative sales campaign, extending a month, in which a free refrigerator was given as the prize in a lottery drawing.

The dealers who participated in the campaign purchased lottery tickets for \$1 each. This money was pooled and applied to the price of the lottery prize.

Each customer who bought a refrig-

erator from any dealer in the group was given a chance in the lottery. When the drawing was held at the end of the month, the person holding the winning stub was given his refrigerator free—he received a paid-up contract if he had purchased his refrigerator on a payment plan, or, if he had paid straight cash, the money was returned to him.

Through the plan, one customer received a free refrigerator in the month's campaign, and the dealers contributed to the expense of the lottery in proportion to the number of units each sold during the contest period.

Henley Elected To Presidency Of Birmingham Bureau

BIRMINGHAM, Ala.—E. H. Henley, president of Birmingham Electric Battery Co., Norge distributor, was elected president of Birmingham Electric Refrigeration Bureau at its annual meeting here recently. Mr. Henley succeeds C. R. Matthews, of Matthews Electric Supply Co., who has served for the past year.

James Cleary of Cleary-Marsh, Inc., Universal distributor, was elected vice president, and Ira F. Randall was re-elected secretary-manager.

- WHAT DEALERS ARE SAYING & DOING -

Graves Looks to Flint Area Farmers For Steady Winter Business

(Continued from Page 6, Column 5) but I don't think there'll be any more flare-ups.

"For one thing, the union is much stronger. Before the strike they could poll perhaps 35% of the men. Now they must hit between 60 and 65. Their headquarters are upstairs," he lifted his head, "and they're coming and going all day long."

"They've gotten what they asked for across the way. As much as \$65 a week in a lot of cases. That's good money—and they put it right back in circulation. This year should be good."

Farmers Good Prospects In the Winter Time

J. G. Graves, owner and manager of the Graves Radio & Appliance Shop, reported in complete agreement with other Flint dealers.

"I'll say business shut down. As far as the workers go, themselves, they average only about 15% of my business—and yet I didn't sell a single refrigerator throughout the strike.

"I don't expect to for a good 10 days more. Money will take that long to get moving. I don't mean grocery bills, either—that would still put it in circulation. What I mean is it will take two more pay days before they'll have the confidence to spend."

The factory trade is best in spring and early summer with Mr. Graves. It's slow throughout the fall and winter. In those seasons the farmers come in. They're less busy in winter, he explained. That's when they do their shopping.

"They're the finest customers a man can get," he maintained. "They're not hard to please. And if you treat them right, if the article you sell them does half of what you say it will, they'll come back for appliance after appliance."

"They're a good market for reconditioned boxes—or ice boxes taken as trade-ins," he pointed out. "A few of them are still out off the power lines. But they won't be much longer, and the contact is worth your time. That's why it pays more to charge \$10 more on a reconditioned box and have it last. I put a 30-day guarantee on every used box I sell, but I expect it to be good for a year."

Mr. Graves has established the policy of allowing a straight \$5 on every old box he takes in, sight unseen. And of asking a 5% down payment on every refrigerator sold on time, plus carrying charges. Some of the trade-ins aren't worth \$5, he agrees; but he figures the 3% average loss more than paid for before he gets through.

"I sell what I can of the old ice boxes," he explained. "At the end

of the week I ship the leftovers up to the Michigan Auction house here in Flint. They take 15%, and it's worth that much to have them off my hands. I'm expanding the store to put up a range display in the annex and the space is needed.

"But I never let an old model electric go," he emphasized. "The older it is, the better. I recondition it throughout and set it up in the middle of the floor. Then I advertise it in the papers. When people see the new models surrounding it they hardly ever buy the old one. But whoever does buy it gets his money's worth—I guarantee that."

The Graves shop depends upon service to maintain its good name, especially in the outlying districts, the manager backed up this guarantee. He sustains no service staff of his own, but keeps contact with a local concern nearby. Two men are always on call, and the farthest customer is reached within three hours.

"And that's a big point in your favor if you're dealing with the rural trade," he affirmed. "Usually it's a serious inconvenience when something breaks down out there, and if you're right on the job when they need you it cements goodwill like nothing else."

"Personally, I've lived in Flint all my life, and I know I still trade with most of the people my dad did. It doesn't take much to keep on friendly relations with your customers—and once you've built up that relationship, you have to work pretty hard to take it down. If you haven't got what he wants an old customer

sometimes will wait a couple of weeks till you get it in, even though he might get it right away from some other store down the street.

One thing that has contributed to good feeling, Mr. Graves feels, is the cash policy he has always encouraged. A low down payment and months of piecemeal collection is a definite handicap to friendly goodmornings.

"People who want to make a \$3 down payment and give \$5 a month don't make the best customers," he rejoined. "If they can afford that little it makes it pretty tough for everybody, and easier for him to turn it in within the first month or so. A man who's made a substantial initial investment and can see his way clear to owning his refrigerator in a relatively short time takes a lot more pride in it."

And with wage increases and the local return to industry Mr. Graves foresees a better year ahead.

"Even if it doesn't start till June, it's going to be a big year—bigger than 1929 or 1936."

Business Returning, Dept. Store Dealer Declares

Another dealer, in one of Flint's big downtown department stores, reported returning business already beginning.

"Last week was as big as last year at this time," was his comment. "But things were stopped dead for a while. When you could set up a baseball game in here and not hit a customer all morning, you'll know what I mean—and it was just like that, without exaggeration."

"Things here were paralysed to a degree that even the bank holiday four years ago couldn't equal. Business throughout the whole city just stopped dead, that's all."

There are no retired business men in Flint, he went on to elucidate. Everybody within a 20-mile radius around is drawn into the industrial scene which is the city's one vital artery. Everybody either is part of the automobile industry or works in a business that is dependent on it.

Payments to Palmer Start With First Pay Check

While sales at the Palmer Radio & Appliance Co., Norge dealership, shrank well below normal during the G-M strike, the company's appliance business didn't fall off entirely, according to C. F. Jackson, veteran salesman, who said that he himself had sold five refrigerators while the strike was going on.

On sales made to factory workers while the plants were closed, this company, according to Mr. Jackson, "took the men's badge numbers and notes (after checking their credit), and sold them appliances. First payment on these sales, he said, will start as soon as the workers get their first pay checks.

"We played ball with the boys out at the plant—why, we even sent out a couple of crates of oranges to the sit-downers," declared Mr. Johnson.

"Last week was like old home week," he declared when asked about the effect which the reopening of the plants had on sales. He added that on the day before we called to see him (Feb. 23) he had sold a range, refrigerator, and other appliances, which represented approximately

\$400 worth of business.

An extension of three months on payments due during the strike was granted to factory workers who had time payment purchasing contracts with the Palmer Radio & Appliance Co., the salesman reported.

This dealership's service business increased perceptibly during the strike, according to Mr. Jackson.

"The boys were kept busy answering calls to repair radios, and they had some calls on refrigerators, too; it looked as though as soon as the factory workers were at home all day with nothing else to do, they started finding things wrong with their radios and appliances."

Larson's Found Rising Business Completely Cut Off by Strike

Griffin Stegall, one of the three co-partners of Larson's Radio & Appliance Co., reported "no sales" for the strike period. The store is located on Chevrolet Ave. within a block of one of the main G-M plants, and Mr. Stegall told us, the street was blocked off to traffic throughout the strike.

Stewart-Warner and Norge lines are carried at Larson's. This firm also allowed three-month extensions on payments owed by factory workers while they were out of work.

Mr. Stegall stated that the firm had been established for about a year, and that while sales were pretty slow during its first six or eight months, they picked up then.

"I guess the people weren't sure we were going to stay in business at first, but since they see that we're still here, more of them will buy from us this year," he added.

Desire for Latest News Made Radio Sales, Moyers Reports

"Things were sure dead here during the strike. The finance companies wouldn't accept contracts on sales to G-M workers, so we took things easy around here." This summation of the effect which the strike situation had on his business was made by Harry Moyers, head of the Home Appliances, Inc. dealership handling Kelvinator and Copeland refrigerators.

"After things were settled and the men got started back to work, buying started again. We sold nine refrigerators last Saturday. It was the next to the largest day we've ever had," Mr. Moyers declared.

Of the nine sales, he told us, the majority were to factory workers. The Home Appliances, Inc., is situated within a few blocks of the Fisher Body plant on Saginaw Ave., and most of its sales are to plant workers, we were told.

Asked what arrangements were made on payments due on appliances during the strike period, Mr. Moyers said that one finance company which carried the store's paper had deferred payments with May as the deadline, charging a 50-cent fee to cover bookkeeping charges on the accounts. The other two firms with whom the company also has accounts, Mr. Moyers said, "didn't know there was a strike going on in Flint."

Commenting on the general tenseness which prevailed in Flint during the strike, Mr. Moyers described the plant workers who came in to his shop to see about payments during the shut-down period as being "all

(Concluded on Page 9, Column 1)

"QUIET PLEASE"

Comfortable and Air-Conditioned Quarters allow more concentration on everybody's everyday job... Keep prospects and customers at ease and in a more receptive frame of mind... Reduce annoyance and distractions.

Century Motors are especially adapted to Air-Conditioning, because:

- They start quietly—run quietly—and are remarkably free from vibration.
- They were ready for Air-Conditioning long before Air-Conditioning was ready for industry.

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CENTURY ELECTRIC COMPANY
1806 Pine Street + St. Louis, Mo.

Offices and Stock Points in Principal Cities

SIZES UP TO 600 HORSE POWER



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SIZES UP TO 600 HORSE POWER

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AERO SELF-ALIGNING SEALS**

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They Seal and Seal Immediately!
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AERO PRODUCTS CORPORATION
36-08-34th St., Long Island City, New York

Flint Strike Only Postponed Sales, Thompson Feels

(Concluded from Page 8, Column 5) keyed up, almost to the point of exploding."

"Of course, you couldn't take sides," he added. "One man might be a union man and you'd have to agree that his side was in the right; the next customer might be against the union, and you'd have to agree with him."

"We sold some radios during the strike and had a lot of calls for them," Mr. Moyers said. "I guess most of the people in Flint kept their radios going all the time so they wouldn't miss any of the broadcasts on what was happening at the plants," he added.

November and December were exceptionally good sales months for this dealership, Mr. Moyers said. In fact they were better selling months, he declared, than the summer months—particularly July.

"We sold 37 electric ranges during the two months," he told us.

The store has four salesmen who, according to Mr. Moyers, don't do any canvassing to obtain new sales leads. Most of the new leads, he declared, come from persons to whom the company has sold appliances.

"Even if we only sell a second-hand radio, we try to make a friend of the customer, and then we sell him other appliances when he needs them. The salesmen know their merchandise, and how to sell it," he stated.

The Home Appliances, Inc., has been handling appliances for a little over a year, and Mr. Moyers is very enthusiastic about the prospects for 1937 sales because he believes that the new models this year "have more eye-appeal, and are more practical than ever before."

Dave's Manager Says Bus Strike Started the Downgrade

According to Joseph Thompson, manager of Dave's Appliances, at 917 N. Saginaw St., while business was pretty much at a stand still during the G-M strike, it got started on the down-grade early in December when a still unsettled bus strike robbed the people of a means of transportation, and consequently lopped off store traffic.

"That's when the trouble first started here," he said, explaining that street cars were replaced with buses on Dec. 1, and on Dec. 3 the bus drivers went on strike, and the busses still aren't back on the street. Flint business as a whole has been suffering acutely from this tie-up, Mr. Thompson believes.

Sales at Dave's Appliances picked up a little after the strike truce was reached, Mr. Thompson said.

"Last week was good—by that I mean that the week's sales were about what they are normally, but this week they've slowed down again. Business has been so bad that a good

week looks like a million dollars," he commented.

Mr. Thompson didn't think it at all strange that the factory employees should buy appliances so soon after their incomes had been tied up—as the slight increase in his previous weeks' sales seemed to indicate.

"Put yourself in the place of one of the factory worker's wives," he said, "if you'd been planning on buying a new refrigerator or range all winter and then the strike came along and you couldn't buy it, wouldn't that be the first thing you'd think about when the strike ended?"

More buying on time is done in Flint than in any city with which he is familiar, Mr. Thompson told us. The majority of the factory workers, he claimed, spend their money as fast as they make it—and he added, "if we don't sell them appliances, someone else will sell them an automobile or something."

Arrangements which this firm made with the two financing companies which handle its accounts with regard to payments on contract-bought appliances which factory workers were unable to meet during the strike, deferred the delinquent payments to the end of the contract term, Mr. Thompson said.

By this plan, he explained, the factory workers' credit would be kept clear, and they would not be continually behind on regular payments. A 50-cent tax was added to defray accounting costs, he added.

Stewart-Warner, Leonard, and Crosley refrigerators are carried at Dave's Appliances. The store employs 10 salesmen and the men get many of their new leads through using a trailer containing appliances, Mr. Thompson told us.

Strikes Slow Up Sales to Workers in South Bend's Dependent Industries

SOUTH BEND, Ind.—Reverberations of strikes in Flint and Pittsburgh rumbled through South Bend in January and February, blocking off sources of income for the vast majority of South Bend's workers. Glass shortage caused by strikes forced Studebaker to curtail production; and the General Motors strikes held up orders in the Bendix plants—South Bend's two chief mainstays.

Hence the refrigeration selling season did not get off to so fast a start as South Bend dealers would have liked. But a noticeable upturn has come in the last two weeks.

At the big George Wyman & Co. department store, where General Electric appliances are sold exclusively, close to 50 refrigerator sales have been closed thus far, with several more on the verge.

Last week two Disposalls were sold, and during the last 10 weeks five dishwashers have been installed. These latter have gone for the most part into the homes of Studebaker and Bendix executives, including Jack Studebaker, partly as a result of a local newspaper campaign which was in the nature of a windfall to the dealer.

Becoming concerned over the unsanitary condition of beer glasses in South Bend restaurants and beer parlors, the newspapers campaigned vigorously for proper cleansing methods, incidentally going into some detail regarding what constitutes sanitation, and what measures must

be taken in washing to eliminate harmful bacteria.

All this was right down the alley of the dishwasher salesmen, who had the complete answer to the problem of utensil sanitation, and who were able to apply it to their sales story to home-owners.

W. B. Edwards is manager of the appliance dept. of George Wyman & Co., and Donald E. Eldridge, Jr., is manager of the store.

Mrs. Nellie Morris, home service director, has been with the store a little more than a year. She was trained by Edwina Nolan in Cleveland, and then went to the Indianapolis General Electric distributorship, where she worked under A. E. Head.

In South Bend she is especially interested in promoting the sale of electric ranges, and spends much of her time in activities toward that end. She conducts a cooking school every Wednesday, and helps the salesmen close both range and refrigerator sales.

Five outside salesmen are maintained by the Wyman appliance department. Each one handles all General Electric products sold by the firm, including small appliances.

Lincoln Hardware Opens New Branch for West Racine

RACINE, Wis.—Lincoln Hardware Co., Racine Frigidaire dealers, opened a new branch for the convenience of West Racine and south side residents Feb. 24 at 3114 Washington Av

U. S. Again Interprets 'Remanufacture'

(Concluded from Page 1, Column 1) pressor replaced, if two components are changed at the same time, even though it is only a repair job for the owner of the box, remanufacture has occurred and the dealer or service company is subject to tax as a manufacturer."

The 5% tax on refrigerators was levied under the Revenue Act of 1932, section 608 (b), and was continued by the 1935 Congress for another two-year period. At that time,

D. S. Bliss, deputy commissioner of the Bureau of Internal Revenue, answered NEWS request for an interpretation of the tax, to the effect that cabinets for multiple installations were considered components for household-type mechanical refrigerators and were subject to the tax when sold for such use or when so used by the manufacturer.

Mr. Bliss also stated that compressors were taxable when sold separately by a manufacturer to any person not a manufacturer or producer of refrigerators or refrigerating equipment, if such compressors were suitable for use as a part of or with multiple control household-type mechanical refrigerators.

Reconditioned refrigerators were ruled non-taxable, but in cases where any of the component parts named under the Act were used in repairing a refrigerator, the manufacturer of these parts was ruled subject to the tax, based on his sale price. These components are cabinets, compressors, condensers, expansion units, absorbers, and controls.



COMMERCIAL CREDIT COMPANY FINANCING

GET READY for a big buying year in 1937. A country that thought it was flat on its back is now very much back on its feet and going places.

Well up in the list of intended purchases are refrigerators, automatic heaters, radios, appliances that promise to be the targets of mass-buying on the deferred payment plan.

With Commercial Credit Company financing you can be sure of closing a higher proportion of sales. Intensive national advertising is telling millions of buyers the advantages of Commercial Credit Company's

liberal terms and low cost. Buyers have confidence in the integrity and reliability of the time payment plans of this twenty-five year old nationally known service.

Commercial Credit Company service gives dealers fullest protection against loss from failure to complete payments. An experienced, smooth working credit investigation and collection system, operated through 178 local offices in principal cities of the United States and Canada assures you the cream of the business, prompt remittances, and freedom to concentrate on your sales.

COMMERCIAL CREDIT COMPANY

COMMERCIAL BANKERS
CONSOLIDATED CAPITAL



HEADQUARTERS: BALTIMORE
AND SURPLUS \$60,000,000

FINANCING SERVICE FOR MANUFACTURERS, DISTRIBUTORS AND DEALERS THROUGH 178 OFFICES IN THE UNITED STATES AND CANADA

THE NEW ZENITH REFRIGERANT FILTER ... FOR SULPHUR DIOXIDE FREON OR METHYL CHLORIDE REFRIGERATORS



Engineered Refrigerant Filters in a variety of sizes for varying capacities.

FINER MESH . . .
THAN ANY ASBESTOS SACK!
LOWER PRESSURE DROP!
BETTER PROTECTION!

Special features include: Patented Element—Easily and Quickly cleaned—Easy to Install—Insures Positive Protection from Dirt in the Refrigerant Liquid—Corrosion-proof, Leak-proof and Ample Capacity. Write for full details.

ZENITH CARBURETOR CO.
Subsidiary
BENDIX AVIATION CORP.
Detroit, Michigan.

AROUND THE WORLD WITH GEORGE F. TAUBENECK

Admirable people, the Dutch, and Editor Taubeneck believes that in the story of how they obtained their international strength, and how ruggedly they maintain their financial integrity, may be something to chew on for those who are trying to fight their way through the muddled economic and political thinking which prevails in America today.

Next week the travelog flies up to Copenhagen, and then over to Sweden, another great country where the thinking is still straight—and where the idea of refrigeration does not have to be sold.

A Nation Founded on Tolerance

People often ask how The Netherlands "got that way." In the first place, who was it that got the idea to build dikes and take land away from the sea? How did they decide on the particular part of the coastline they wanted?

And most of all, how does it happen that this tiny country of underseal dwellers, living on borrowed land which has practically no natural resources at all, become a leader in the affairs of Europe and the Asiatic Tropics, and banker to the world?

Well, like so many things, it all started out as an accident. The Netherlands comprises a piece of land which is just below sea level. At first it was largely marsh and swamp. But there were some natural dikes there when the first settlers arrived.

These natural dikes were—and still are—a series of sand dunes. They run, with a few interruptions (like the rivers Rhine and Meuse, and several smaller streams) from Belgium almost to Denmark.

Just who the early Dutchman was who first conceived the idea of connecting and strengthening these sand dunes with dikes I do not know. History may record his name, but that we leave to the scholars. Build the dikes they did, and drain the marshes, too, forcing the water uphill into the river outlets.

And then came another accident. Fish arrived. Herring had for centuries been caught chiefly in the Baltic; but for some reason known only to herring, they decided once upon a time to make a mass movement toward the diked shores of The Netherlands.

Thus was born the Dutch fishing industry. Europe being almost 100% Catholic, and devout, at the time, Friday was fish day for the continent; and the Dutch sold all the herring which they could catch.

Their boats carried dried herring to all ports. They couldn't return with empty holds, so they brought back grain, and other staples. They became traders. The bad cooking of medieval times made the spices of the East a demand item; so soon these hardy seamen set sail for the Indies.

Over there they had to fight for trade with the English, the Spanish, and the Portuguese. Having led a harder life, they were tougher. Nor were they all tied up with the Propagation of the Faith. So they hacked out a Colonial Empire, and a rich one, for themselves.

Retaining their qualities of toughness, plus thrift, they became capitalists. They organized and financed great tea, coffee, and rubber plantations, and made more money. And to this day Amsterdam is a banking city where all world comes to borrow.

During that time they had to fight for, and win, their own independence. Which they did, with the aid of religious dissenters and political escapees from all over intolerant Europe.

The Netherlands, you see, were the strongest adherents of the policy of *laissez faire*. Let a man be industrious, they said, and we care not what he thinks on abstruse subjects. We are business men, not philosophers. So men of great ability, branded and scourged as heretics in their own nations, castigated and robbed of their property, came to Holland to live and work and to prosper.

Ever since that time Holland has been a land of people who mind their own business. They do that, literally. Not only do they "live, and let live," but they concentrate their energies on making a good living, not in trying to tell someone else how to live.

That is why The Netherlands is a great nation.

You Can't Beat the Dutch

Many business men in The Netherlands told me that America was crooked! Why? Because we had devalued the dollar.

Now devaluation, they said, was justified when a nation's gold reserve dropped below par, but only in proportion to the loss of that gold reserve. The United States, on the other hand, had a huge gold excess in its underground vaults.

To do the honest thing, we should have revalued upward! Expediency, the loss of markets because other nations had depreciated their currencies, seemed beside the point to them. Were they not taking it on the chin, and hard, for the same reason?

Their argument was that by devaluation we had welched on our contract to pay holders of our notes a certain specified quantity of gold. That was dishonest. And to be deplored.

Since my return Holland also has devalued somewhat, but not without a bitter struggle, and only in proportion (not exact, to be sure) to their gold losses.

Now you see why Amsterdam and Rotterdam banks have for centuries been the haven of capital in flight from predatory and unstable governments. Above all else, she maintains the stability of her credit, balances her budget, and sustains her financial integrity.

This is an inbred trait with the Dutch people. It is also well exemplified in the persons of Queen Wilhelmina (one of the world's richest persons, who has become so by means of wise investments, rather than by confiscating it, like most of the world's wealthy rulers) and Premier Hendrik Colijn. A balance sheet to these two individuals is a favorite form of literature.

Queen Wilhelmina, whose family



The sober visages on these Hollanders—and the Dutch girl—are indicative of how seriously they take life and business. There isn't much bustle to be seen, but one gets the impression that a lot of thinking is done.

has attained its highly enviable financial position by shrewd investments and biding its time, will countenance no get-rich-quick or blue-sky schemes. Nor are the Dutch people inclined to be gamblers. Hence today the magic money formulas so popular with the people everywhere, including the United States, find no ready reception over there.

They do not expect to get something for nothing

The East Indies

It is said that nearly every Dutch family owns some stock in Royal Dutch Shell (whose presence is manifested in our country by those ever-

Even so, it has been a profitable investment, as well as a source of patriotic pride, for all concerned. Over a long-term period, it is possibly overshadowed only by the French-owned Suez Canal as a high dividend bearer.

As rulers, the Dutch seldom have to worry about an insurrection—which is a costly thing and a profit subcontractor, as the British well know.

But the Dutch have no moral compunctions, as do the British. They are not missionaries. That dictum of "the White Man's Burden" seems silly to them.

As noted previously in this series, the British consider themselves as a race apart, almost godlike, in their relations with natives. Intermarriage to them is synonymous with social ostracism, for instance. Not so, the Dutch. They intermarry freely, and without qualms.

Eurasians are entirely acceptable socially, both in the Indies and in Holland. Again, the Dutch mind their own business.

It has been observed by anthropologists that a strong strain of Javanese is discernible all through Holland. The race seems to have suffered no ill effects from the commingling of totally foreign blood lines.

In Java there are two kingdoms which have been allowed to remain intact. To be sure, each king has a Dutch Big Brother at his side; but he is interested in trading, not ruling. The Dutch pay for education and public health (also canals and good roads) in their colonies because it is good business to do so.

Everywhere throughout the Dutch East Indies the native chiefs are allowed to continue their rule. Tribute is not exacted in return for protection and public works, which the natives—and particularly the chiefs—sincerely appreciate. And having Home Rule, they keep their self-respect.

There is one cloud on the East Indian horizon, however. That is Japan. Already economic penetration has begun. And the omnipresent Japanese fishermen with their cameras have been found surveying Dutch colonial coastlines.

The hot, fertile territories of Java and Sumatra are exactly the kind of country which the overcrowded Japanese covet most. Cognizant of this fact, the Dutch are beginning to spend heavily for armaments, for the first time in decades.

Crowded Population

With an area of 13,202 square miles and a population of 7,832,175 (1930 census), The Netherlands has a density of 591 people per square mile. None of the United States, except Rhode Island, is crowded as is Holland.

By comparison, the area of The Netherlands is equal to that of Connecticut and Massachusetts combined, and the population totals a little more than does the aggregate population of Ohio and Colorado. To be as densely populated as the Netherlands, the United States would need a population of 1,800,000,000 instead of its present 125,000,000.

Almost a third of the whole Dutch population is concentrated in the six cities of Amsterdam, Rotterdam, The Hague, Utrecht, Haarlem, and Groningen. In order, their sizes are 752,000; 582,000; 437,000; 154,000; 119,000; and 105,000.

How do these people live? What are their customs? How do they dress? What sort of homes do they have? Do they do anything but work? Why do Dutch women so scrupulously scrub their houses? What are the Dutch amusements and diversions?

Vell, we'll tell you.

Racial Types

Very roughly speaking, there are three types of people in The Netherlands. These groups are the Frisians, the Saxons, and the Franks. This classification must not be taken too literally, for there are no clear-cut distinctions between the divisions.

Generally speaking, the Frisians are in the northern provinces, the Saxons in the eastern and southern, and the Franks in the western and southwestern provinces.

Still generally speaking, each type has different traits, characteristics, and physique.

Notice: The typical Frisian has a large frame, well-shaped limbs, a fair complexion, and a smooth, soft skin. He tends to be quick-tempered; but he ameliorates this trait by being liberal in his views and eager to learn. That he would rather engage in agriculture or sea-fishing than in manufacturing is indicative of his love of independence.

Much chunkier than the Frisian is the exemplary Saxon, a broad, squat figure with rugged flesh, docile temperament and (don't sue us!) slow-functioning, brain who prefers industry to any other line of work.

The Frank is small and dark, has an olive-hued skin and unattractive features, and is a methodical worker who adheres to set routine. His sentiments are strongly attached to old things and to customs of the past.

Agriculture is his vocation—tiling, not dairy pursuits. The Frank is said to have an inherent aptitude for the fine arts, but seldom does much to express it.

(Concluded on Page 12, Column 1)

Scenes from Everyday Life in Villages of The Netherlands



(1) In Volendam a group of villagers stops to appraise newcomers disembarking from a boat. (2) There's no distinction between sidewalk and street in these villages; it's just an artery between the neat brick dwellings. (3) Even in play Dutch boys are as grim as they are sturdy. (4) Street magician draws absorbed crowd in Leyden—but they keep a distance both respectful and wary.

Copeland Campaign To Break This Month

DETROIT—Copeland Refrigeration Corp. will break its nation-wide advertising campaign in national magazines and local newspapers sometime during March, according to an announcement made by J. D. McLeod, general sales manager.

"Having nearly completed our program of distributor and dealer enfranchisement," declared Mr. McLeod, "we are now ready for advertising on a national scale."

Central theme of Copeland's 1937 campaign will be the refrigerating unit itself. Copy will point out that aside from the unit, there is little difference between any of the better refrigerators.

Consequently, the copy suggests, the superiority of the compressor should be the influencing factor in your decision.

A series of ads based on this theme and illustrated by actual photographs have been designed for Copeland by Baldwin & Strachan, Inc., Buffalo. These ads will appear in *Time* and *The Saturday Evening Post* as well as in a selected list of newspapers covering most of the principal cities in the United States.

New Baltimore Distributor Carries Norge Line

BALTIMORE—Silver Craft Distributors, a new electrical appliance firm formed by S. P. Brayson and Harry Koran, was opened at 429 N. Eutaw St. here recently. The company will carry the Norge line of electric refrigerators and appliances.

Texas Utility Breaks Quota Mark By 50%

SAN ANTONIO, Tex.—Topping its quota by nearly 50%, the merchandise and new business department of the South Texas Department of San Antonio Public Service Co. rang up a total dollar volume of \$77,438 for merchandise sold during 1936. The department's quota had been \$52,224.

Refrigerators led the list of major appliances with 166 unit sales. Appliance sales also included 90 ranges, 78 radios, 61 washing machines, 197 irons, 21 water heaters, 44 fans, and several hundred small appliances. In addition, the merchandise total included 25 commercial refrigeration jobs with 600 hp. in motors.

Regulation of sales through intensive seasonal campaigns resulted in balanced load building throughout all of the various districts. As a result of the particularly intensive initial load-building work done in unserved areas, many new lines were necessarily constructed.

The utility's 1937 load-building program will be built around the increasingly popular theme of modernization and kitchen electrification.

Peck Bros. Get Gibson Franchise for Oregon

PORLAND, Ore.—I. H. Peck, president of Peck Brothers, Inc. here, has announced the appointment of his firm as distributor for Gibson electric refrigerators in Oregon and southwestern Washington.

Peck Brothers have been dealers in auto supplies and home radios for some time.

Platt New Appliance Sales Head For Goldblatt Bros.

CHICAGO—George R. Platt, general manager of the Goldblatt Bros. South Chicago store for the past eight years, has been transferred to the company's new State St. store where, as head of the electrical appliance and house-furnishing departments, he has charge of the sixth, seventh, and eighth floors.

Before he became affiliated with the Goldblatt stores, Mr. Platt was controller in charge of finances at the S. Lederer Co.

Clifford C. Ward Appointed To Dealership Post

CEDAR RAPIDS, Iowa—Clifford C. Ward has been appointed assistant manager of the Home Specialty Store, Stewart-Warner dealer here.

Retail Licensing Bill Goes Before National House

WASHINGTON, D. C.—A bill to require all retail store operators to obtain a license from the State Revenue Commission was introduced in the House by Representative Sampier of Benton, Ark., last week.

Under the proposed bill, which was referred to the Committee on Revenue and Taxation, annual license fees would range from \$2 for a single store, to \$700 for each store over 31 owned by an individual or corporation.

H. E. Dunn Co. Gets Crosley Franchise In Nebraska

OMAHA—The H. E. Dunn Co. has been appointed distributor of Crosley refrigerators, radios, and laundry equipment in Nebraska and southwestern Iowa.

- PROFITABLE SALES METHODS -

Trade-In Allowances On Old Clothing, Shoes, Blankets Aid Dealer's Campaign

OKLAHOMA CITY—Advertising in the classified section of leading daily newspapers that for one week it would give special trade-in allowances on old clothing, shoes, blankets, and furniture toward the purchase of appliances was the central idea in a promotional campaign tried by Moody's, Inc., electrical appliance dealership operating three stores in this city.

The insertions listed the table of articles which would be accepted and their trade-in values, and stated that while the regular trade-in allowance on appliances was 10%, the firm would accept \$5 in cash and the remainder in the listed articles, during the week's campaign.

Prices quoted on trade-in merchandise listed in the advertisements included among others: men's coats \$5; blankets, \$1.50. All articles accepted as trade-ins, the copy stated, would be turned over to the Salvation Army.

Appliances upon which the offer was effective included: Westinghouse refrigerators, washers, irons; Norge refrigerators, washers, irons, ranges; Leonard refrigerators, Electrolux refrigerators, Chambers ranges, Easy washers, G-E and Thor washers, Philco, Victor, and General Electric radios.

George Moody, head of Moody, Inc., stated that in order to make this special offer, the company's salesmen had agreed to a salary basis during the week's campaign.

Series of Free Matinees Nets Georgia Dealer \$24,000 in Sales

ALBANY, Ga.—Within four weeks after it had given six free matinees at neighborhood theaters from which it obtained the names and appliance needs of 3,400 prospects, the South Georgia Electric Appliances, Inc., General Electric distributor here, sold \$24,000 worth of merchandise.

The campaign was built around the G-E film titled "Three Departments for Women," and was staged by P. A. Ross, the distributorship's sales promotional manager, who arranged for the shows, saw that prospect names were filed, and that follow up calls were made by company salesmen.

Details of this sales promotion program included matinees held in six neighborhood theaters, performances being spaced three days apart. Before each show, dealers known in the locality in which the theater was located, spoke to the audience, calling attention to the distributor's new selling plan, and stressing the convenience features of owning an electric refrigerator and other appliances.

Free copies of slips containing directions on the use and care of the appliances shown in the film.

were given to women who attended the show. At the bottom of each slip was a list of household appliances, and spaces where the housewife could indicate the equipment which she already had, and the appliances which she was interested in owning.

Each slip contained space for the housewife's name, address, and telephone number.

"Our movie campaign not only proved an effective means of reaching the public, but also had a good effect on the morale of our salesmen," said Mr. Ross. "In one week we provided them with more live prospect leads than they could have secured for themselves within eight weeks."

The sales organization is still getting the benefit of the campaign, he declared. Cost for putting on each show was approximately \$55.

'Swing' Displays Enter Refrigeration Field in Crosley Exhibit

CINCINNATI—Swing displays are to be offered at the fifth annual Electrical Progress Exposition, which will be held here March 15 to 20, in the Union Central Annex, Third and Vine streets.

Don Howard, designer, Rob Rogers, technician, and Fred Wade, construction engineer, on the staff of Cooperative Displays, have built something new in the way of an exhibit for the electric refrigerator division of the Crosley Radio Corp., which according to Wade, is the most novel and pretentious of its kind ever shown.

It consists of a mammoth revolving globe, cut out to reveal two Salvador refrigerators; one closed and the other open. The swing idea is carried out by the figure of a man mechanically operated, who moves his head and hands in an inspection of the refrigerator. The mechanical base of the exhibit is both intricate and elaborate, and, of course, is concealed.

"Swing," according to Howard, is the thing, now-a-days, in modern exposition the same as in modern music.

Eugene P. Zachman, business manager of the Cincinnati Electrical Association, sponsoring the exhibition, announces that swing will be a feature of imposing displays of other nationally-known manufacturers to be shipped here from various points for participation in the Electrical Progress Exposition.

Dvorak Named Water Heater Specialist for G-E

CLEVELAND—Elmer Dvorak has been appointed water-heater specialist in the range and water-heater division of General Electric Co., as part of the intensive sales promotional activity planned by this division.

Mr. Dvorak has been with G-E since 1934 when he started work in the campaign division under Jean De Jen. As an officer of the Toppers Club he became acquainted with many of the company's salesmen, and became familiar with their various problems.

When the range and water-heater division began to expand its operations, Mr. Dvorak was selected to do contact work on water heaters. He has been associated with this division since December.



VALVES and

FITTINGS



Engineers know Weatherhead Refrigeration Valves and Fittings are dependable . . . they always come through.

Today engineers place as much faith in Weatherhead valves and fittings as the early ranchers did on their hip cannons. These Westerners always knew they'd shoot straight—and now engineers know Weatherhead parts always fit straight and true and as

tight as the proverbial blood sucker's clutch. As to finish and machining it's not boasting to say they have the finish "you love to touch." See them, try them. You'll be saying the same thing. For a square-shooting fit insist on Weatherhead valves and fittings.

THE WEATHERHEAD CO.
300 EAST 131ST STREET • CLEVELAND, OHIO

(Concluded from Page 10, Column 5)

Those Costumes

The typical Dutch costumes are undeniably on their way out of everyday life in The Netherlands.

Volendam, Marken, and one or two other Zuider Zee towns still cling to the picturesque wooden clogs, baggy pants, full skirts, nondescript sweaters, tight embroidered bodices, round black caps, and white lace caps with diaphanous wings, but even in such places as these the trend toward modernity is discernible.

Not even the attempts of Queen Wilhelmina to encourage the retention of the local costumes by occasionally donning the attire of a Friesland housewife can check the march into oblivion.

Costume balls in the fashionable districts of the large towns are attended by ladies of society wearing the erstwhile common apparel of the Dutch peasants. Sure sign of senility!

At present, Sunday and market-days are practically the only excusable occasions on which the women of Zealand, Groningen, Friesland, the southern part of Brabant, and a few other such localities see fit to wear their colorful finery.

When the natives of Volendam, Marken, Urk, and Friesland visit Amsterdam while attired in their Sunday-go-meeting dress, they really create almost as much stir as they would if they ambled down Fifth Avenue. (New York, of course, is used to almost anything. The only thing a New Yorker stops to look at is an excavation.)

Pervading tendency in the costumes of the women in "old" Holland is to hoist up the rear, which is accomplished by wearing an abundant supply of petticoats, and by drawing the waist taut to afford sharp contrast.

"New" Holland, as typified by The Hague, strives to keep as close as possible to Paris in the matter of fashions for women, and to London for men's styles.

Jewelry and Perfume

A great number of men and women in The Netherlands are particularly fond of jewelry and fancy adornments, and almost every village has at least one thriving jewelry shop to cater to the whims of the inhabitants.

The countryfolk are partial to gold and silver ornaments, in the form of buttons, brooches, earrings, pendants, and even ornamented skull-caps. The latter are worn only by married women and widows of Friesland, and they are sometimes exceedingly valuable. Often they become heirlooms.

The men like to wear chains, shoe-buckles, and rings of gold and silver.

Most Dutch women have two irrepressible weaknesses. They find it hard to resist the temptation of perfume, which they buy extravagantly; and they would like to become flat-chested. Normally they are fuller bosomed than Jewesses. So tight do they wear their bodices that their breasts are often definitely disfigured.

Woodenshoe Like a Pair?

The wooden shoe is a Dutch national institution. One is called a *klomp*, a pair *klompen*. The name is appropriate, for the sound made by two of them, motivated by a heavy-footed Dutchman, is exactly that. They are carved from poplar wood, and can be used as weapons, toys, water-dippers, and ornaments, besides acting as waterproof foot-coverings.

Old wooden shoes are readily convertible into tiny boats, and serve as children's playthings. A well-aimed *klomp* can also be quite effective in deciding the outcome of a fight between Dutch boys, and one wielded by a wife can urge an errant husband (yes, they have them in Holland, too) to mend his ways.

Apparently a hindrance to easy walking and running, a pair of wooden shoes when thoroughly "broken in" seems to give the wearer no trouble at all. Once the knack of keeping them on is mastered, *klompen* might just as well be sandals for all the deleterious effect they have on the mental ease of the Dutch. But not you and I, brother, not you and I!

There are two other uses to which the wooden shoes can be put, the first of which should strike a chord of agreement with many an American who has stood on tip-toe and craned his neck till he felt like a giraffe in order to see over the heads of people in front of him at parades, political rallies, and the like.

Whenever a Dutchman wants to see what's going on in front of the wall of human shoulders blocking his view, he takes off his shoes, stands them one above the other, and balances himself on top of them. Presto! He has an unobstructed vantage point.

The other use is one adopted by the lock-keepers along the canals of The Netherlands. A *sabot* dangling at the end of an extended pole is an excellent, impromptu money-box into

it is held only by local clans.

At kermis time, the dormant devil in the placid, low-class Dutch peasants and fishermen breaks bonds, and is off on a carousal that usually lasts the greater part of a week.

While the sun is up, the streets are teeming with dancing, shouting throngs. The merry-go-rounds wheeze under heavy loads, the peep shows rope in scores of gullibles, and hundreds of unwiped mouths are filled with pop-over, waffles, caramels, fried flounders, smoked eels, and *oliebollen* (native indigestibles composed of balls of paste fried in oil). Drinking? Oh, yes.

After dark, all vestiges of restraint are liquidated by the potent potions, and men and women behave in a fashion simply scandalous to the decent burghers.

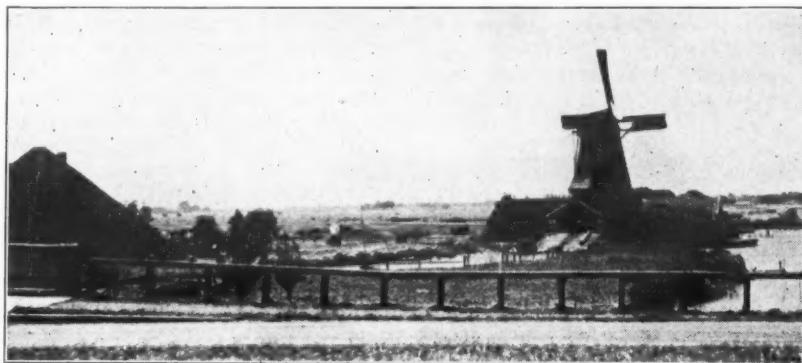
It was my misfortune not to witness a kermis, so this is purely hearsay. But it's reassuring to know that even the Dutch have their moments.

Heavy Eating

Man must eat. The Dutchman, evidently, considers himself to be a lot of man, for he eats huge quantities, and often.

Favorite dish of the peasant and the humble seems to be a Dutch version of the French *pot-au-feu*, or the English stew. Loads of meat and vegetables and gravy are all boiled together to form an appetizing, belly-filling plate of victuals.

Six O'Clock and All's Calm



Chores done and cows milked, the Dutch countryside presents a peaceful picture at eventide. Not a creature is stirring; no *klompen* are heard.

which are dropped the tolls required for ships' passages along the waterways.

Hairdressing

A beauty parlor in the peasant country of Holland would draw as much business as a shop selling earmuffs in Death Valley.

Dutch women and girls wear their hair close-cropped and straight. Under their white headgear are black skull-caps which permit only a fringe of hair to show. To be seen bare-headed in public, particularly in the presence of men, is considered a social disgrace, a breach of decency, in the rural sections.

The brazen girls of the Isle of Marken flaunt the tongue-clacking of the mainlanders across the water in Volendam by exhibiting broad bangs on their foreheads, and two long pigtail down their backs.

Every once-in-a-while, the Dutch break out into a mood of carefree wildness, and throw a "githerin" called a kermis. Much to the relief of the "higher" Hollander the kermis is rapidly dying out, and at present

there are numerous restaurants and cafes of all sizes and classifications in the towns of The Netherlands, and the food they serve is much the same as that in any restaurant in Europe. The chief difference is that the Dutch restaurants dish up meals in larger proportions, one of which could easily satiate two ordinary appetites.

Nothing in The Netherlands quite approaches the gargantuan *rijstaffel* (which is measured by the number of boys carrying it in) that delights and decays the Dutchmen in Java, but the general idea of a Dutch meal belongs to the same school.

In the better-class restaurants cheese, ham, rolled smoked beef, gherkins, and preserved ginger accompany every meal.

Cheese must be cut in certain specified ways, each kind of cheese requiring different tactics. The Edam cheese, for example, must be partitioned across in transparent slices. Haphazard hacks and gorish gouges, say the Dutch, rob the Edam of its freshness, and cause it to turn dry.

No matter what variety of cheese one is operating on, it is an unpardonable sin to mutilate and disfigure it. Cutting one's finger during the process is likewise a serious *faux pas*.

They're Against Devaluation



Shrewd investors in their own right, and every man a capitalist, residents of The Netherlands like these staunch prototypes resist to the bitter end any tinkering with the monetary system.

able sin to mutilate and disfigure it. Cutting one's finger during the process is likewise a serious *faux pas*.

Smaller restaurants bank mainly on eggs and cheese sandwiches, and excellent tea, to draw trade.

Dutch cafés are unique in that they are divided into two sections by curtains. The typical café has two entrances, one for the back room on the other side of the thick, dark drape, and one for the front.

The back part is just like a regular club. Brightly lit, it has an air of warm comfort that invites conviviality. Here one finds a regular group of patrons, some of whom play billiards, cards, and dominoes, others of whom engage in topical conversation, while the remainder is quietly engrossed in reading newspapers and magazines.

A sharp contrast is afforded by the room in front of the curtain. While the rear is ablaze with light, the front remains dark. Customers sit quietly, usually alone, and gaze out on the passing throng beyond the sound-deadening window. Any conversations are carried on in low tones. Most of the customers are content to meditate in unruffled repose.

Like mushrooms there have sprung up all over Holland's cities little places known as *melksalons*, or *milkinrichtingen*, which have become successful rivals to the restaurants and cafés around lunch time.

In them are provided at low cost light snacks of milk, coffee, or chocolate, eggs, sandwiches, and cakes.

Almost every town in The Netherlands has one of the select social circles known collectively as the *societeiten*. In the smaller villages, naturally, these clubs are very informal, and have little or no official organization.

The larger the town, the larger the club; and the larger the club, the more businesslike its formation, the more strict its conformity to the rules.

The De Witte club at The Hague is probably the most distinguished of the Dutch *societeiten*. Its members, totaling around 1,500, are selected from the cream of Dutch society and from officialdom.

That it ranks as high as any similar association in Europe does not mean that the De Witte is at all haughty or aloof. By nature it is

very democratic, and its guests are accorded warm welcomes and sincere hospitality.

Inside a Home

The typical Dutch home, comparatively small and compact, has about it an air of completeness and cleanliness so noticeable that at times the building seems to have a living personality. It is strongly built, and has a definitely masculine appearance outside, with a bit of feminine touch inside.

Built to last, the Dutch home has squat, thick walls, sturdy, heavy doors, strong, gabled roof, and an unstinted, carefully-applied coating of paint.

Yet with all its solidarity it has but one room which is really warm enough to be comfortable in chilly weather, and that room is the kitchen. Great market for oil burners.

The Dutch kitchen is the *beau ideal* of them all. "A place for everything, and everything in its place" seems to be the creed of the *huisvrouw*.

Pots and pans, all scoured and shining, hang in their appointed locations, the cutlery is neatly stacked in cupboard drawers, the chinaware reposes in the cupboards, the decorative blue and white plates are placed just-so on the mantel, and the tongs and andirons in the fire place are aligned with precision.

The fireplace itself is, in all probability, lined with blue Delft tiles, with an iron fireback. Peat briquettes are the customary fuel.

Other rooms are profusely decorated, the ruling motif being that of indiscriminate quantity, rather than planned design. Shipmodels adorn the walls, cabinets, and mantels, vases filled with fragrant, fresh flowers are placed on tables and stands, and in almost every convenient space on the walls hang examples of Delft ceramics and pottery. The interior decorator has found no place among the Dutch professions.

Practically every Dutch home from the grandest to the humblest has its walls literally covered with pictures, which often take the place of wallpaper or plaster.

Some of the tiles bear pictures of windmills, others show sailing vessels, castles, birds, and animals. An entire wall covered with them is a kaleidoscopic confusion of scenes and views typical of Holland.

It Takes Fancy Clothes to Dress a Little Dutch Girl



In all but the third-from-the-left of the above snapshots, the little Dutch girls are wearing elaborate, comparatively expensive old national costumes which are counterparts of those worn by adults in Volendam and Marken. The two boys in the picture which is the exception, wearing normal "European" outfit, were photographed in Scheveningen, fashionable seaside annex to The Hague.

Westinghouse 'Quota Busters' Visit Mansfield & Springfield Plants

(Concluded from Page 1, Column 2)

Today and tomorrow the salesmen will be feted in the new building which houses the Westinghouse refrigeration department here, meeting and listening to company officials, and disporting at R. O. "Flash" Richards' "Gold Nugget Emporium."

Tomorrow afternoon they will board the train for East Springfield, Mass., where another Westinghouse plant will be thrown open for their inspection on Wednesday. They will leave East Springfield to arrive in New York City for more fun Wednesday night.

Among the executives who will address the salesmen are A. E. Allen, vice president; R. E. Imhoff, sales manager, merchandise division; R. C. Cosgrove, household refrigeration sales manager; P. Y. Danley, manager, refrigeration department; I. W. Clark, kitchen planning division; S. D. Mahan, advertising manager, merchandise division; V. E. Vining, Adam Loescher, Roger Bolin, G. W. Erdmann, Jr., L. Van Derau, and Ralph Bisbee.

List of "quota buster" trip winners:

W. G. Despathy, Despathy's Furnishings, Inc., Moosup, Conn.; J. H. Campbell, United Illuminating Co., New Haven, Conn.; C. E. Berkoff, Carl E. Berkoff, Norwich, Conn.; W. E. Barnes, Conn. Power Co., Unionville, Conn.; C. H. Barthel, Stamford Gas & Elec., Stamford, Conn.; N. S. Loveland, Loveland's, Bristol, Conn.; Carl Priebe, United Illuminating Co., New Haven, Conn.

C. L. Foster, Central Maine Power Co., Gardiner, Me.; R. F. Wilkins, New Hampshire Power Co., Newport, N. H.; J. J. Taft, United Music Co., Southbridge, Mass.; E. G. LaRoe, LaRoe's, Woonsocket, R. I.; G. H. Madeiros, Leroy M. Vose, Edgartown, Mass.; Samuel Kaufman, Union Electrical Supply, Boston; G. W. Clark, Carlisle Hardware Co., Springfield, Mass.

Ed. Seidel, Seidel Bros., Bordentown, N. J.; E. W. Seugling, E. W. Seugling, Little Falls, N. J.; L. Terlizzi, Terlizzi Bros., Inc., Bloomfield, N. J.; S. H. Fertig, Westmar Sales Co., Inc., Perth Amboy, N. J.; L. M. Rayhill, Kemp Bros., Utica, N. Y.; Mike Morley, F. Scherer & Sons, Buffalo.

H. Goldman, C. S. Westervelt, H. Hjertberg, and A. Kahn of Times Appliance Co., New York City; W. M. Anderson, W. W. Anderson, Millbrook, N. Y.; L. Holden, Boulevard Appliance Co., Flushing, N. Y.; Wm. Edwards, Electric Service Co., Yonkers, N. Y.; A. J. Richard, Peter C. Richard, Ozona Park, N. Y.; H. F. Dolson, A. C. Smith & Co., Beacon, N. Y.

F. Haas, Wesco, Newark; Harold Agnew, Wilkes Westinghouse Co., Amsterdam, N. Y.; M. W. Rowe, Quality Appliance Co., Union, N. Y.; A. G. Jung, Al. G. Jung, Rochester, N. Y.; A. F. Jones, Jr., Alex. F. Jones Electric Co., Syracuse, N. Y.

R. M. Carson, Hutzler Bros., Baltimore; W. E. Gilley, Dobyns-Taylor Hardware Co., Kingsport, Tenn.; Fred Wolff, Edgar Morris Sales, Washington, D. C.; J. Trimble, Montgomery Electric Co., Silver Springs, Md.; Herbert Lugg, W. H. Lugg, Duryea, Pa.; A. Lloacona, John F. Creveling, Easton, Pa.; W. D. Ruhl, Sanatoga.

THE MASTERCRAFT ADJUSTABLE PAD AND CARRYING HARNESS FOR SAFE DELIVERY OF AUTOMATIC REFRIGERATORS

Pad and harness ADJUSTABLE to many sizes and styles of cabinets. Economical—Efficient. Sturdily constructed, easily applied. Name of refrigerator attractively lettered on pad without charge.

Pad (Adjustable) \$9.50 ea.
Harness (Adjustable) \$6.00 ea.

The Pad and Harness are separate.

Individual carrying straps \$1.75 each and up. Write for 1937 Folder & Prices on entire Pad Line.

BEARSE MANUFACTURING CO.
3815-3825 Cortland Street, Chicago, Illinois

CORROSION-PROOF

Because the non-metallic, corrosion-proof poppet and seat (see detail sketch), in this new Sylphon Automatic Expansion Valve cannot corrode and pit, it always closes off positively, maintains constant pressure, for long periods and without attention.

Poppets are renewable, on the job. Filters are ample in size, readily removed. Moisture-proof . . . no rubber breather cap. All wearing parts renewable. For original equipment and for replacement service on Sulphur Dioxide, Freon or Methyl Chloride systems. Bulletin O-5000.

Sylphon
TRADE MARK

FULTON SYLPHON COMPANY, Refrigeration Division, Knoxville, Tennessee
AUTOMATIC EXPANSION VALVE

Refrigerators Dominate Appliance Displays At Detroit Builders' Show

By James McCallum

DETROIT—Appliance exhibitors at the 19th annual Builders' Show which recently concluded at Convention Hall, here, agreed almost unanimously that electric refrigerators were attracting more attention than any other single appliance at the show.

Whether the booth was a factory-sponsored exhibit, whether it was set up through a department store or a cooperative dealer arrangement, the answer of those in charge was the same—"It's refrigeration for 1937!"

Questioned upon the basic selling factor of refrigerators this year, salesmen for exhibiting firms expressed divergent opinions. Some maintained that people were still following the gadget trend of the last few years, and buying refrigerators on the basis of convenience features alone. Almost as many others, however, reported that prospective purchasers were minimizing the importance of gadgets and placing more consideration on the construction and performance of the unit itself.

Considerable discussion was going on among refrigerator salesmen about the price raise which most manufacturers effected sometime during the course of the show. The general opinion seemed to be that the price raise would not be objectionable as long as all manufacturers raised the price proportionately. The refrigerator men seemed to think that the

existing degree of national recovery perhaps warranted such a raise, but fear was expressed that some companies might not boost their prices.

Salesmen at the Kelvinator factory display reiterated the fact that their sales story for the year would be built around the Kelvin Home. And ample evidence of this fact was offered by the display itself.

Four Westinghouse neighborhood stores, Carson Appliance Co., Wagner Electric Co., Approved Appliances, Inc., and Better Home Appliances, sponsored a cooperative display at the show. G. L. Reid of Wagner Electric explained the reason for this setup.

"It's quite a common custom among Westinghouse dealers," he said. "You see, by combining our efforts we can arrange a larger and more effective display than if we exhibited individually. We sell other makes of appliances, too, but we are exhibiting only Westinghouse here at the show because the factory splits 50-50 with us on expenses."

Mr. Reid also reported that range sales were going exceptionally well, and that combination refrigerator and range sales were frequently made. Asked about the influence of gadgets, Mr. Reid stated that people were looking for fundamental things such as performance, economy, and quiet, efficient operation.

A salesman at the J. L. Hudson display cited the five-year guarantee now offered with most refrigerators

as a valuable sales aid. "But people are still looking for gadgets," he said.

L. C. Roose, of the Norge factory exhibit, also stressed the importance of a longtime warranty.

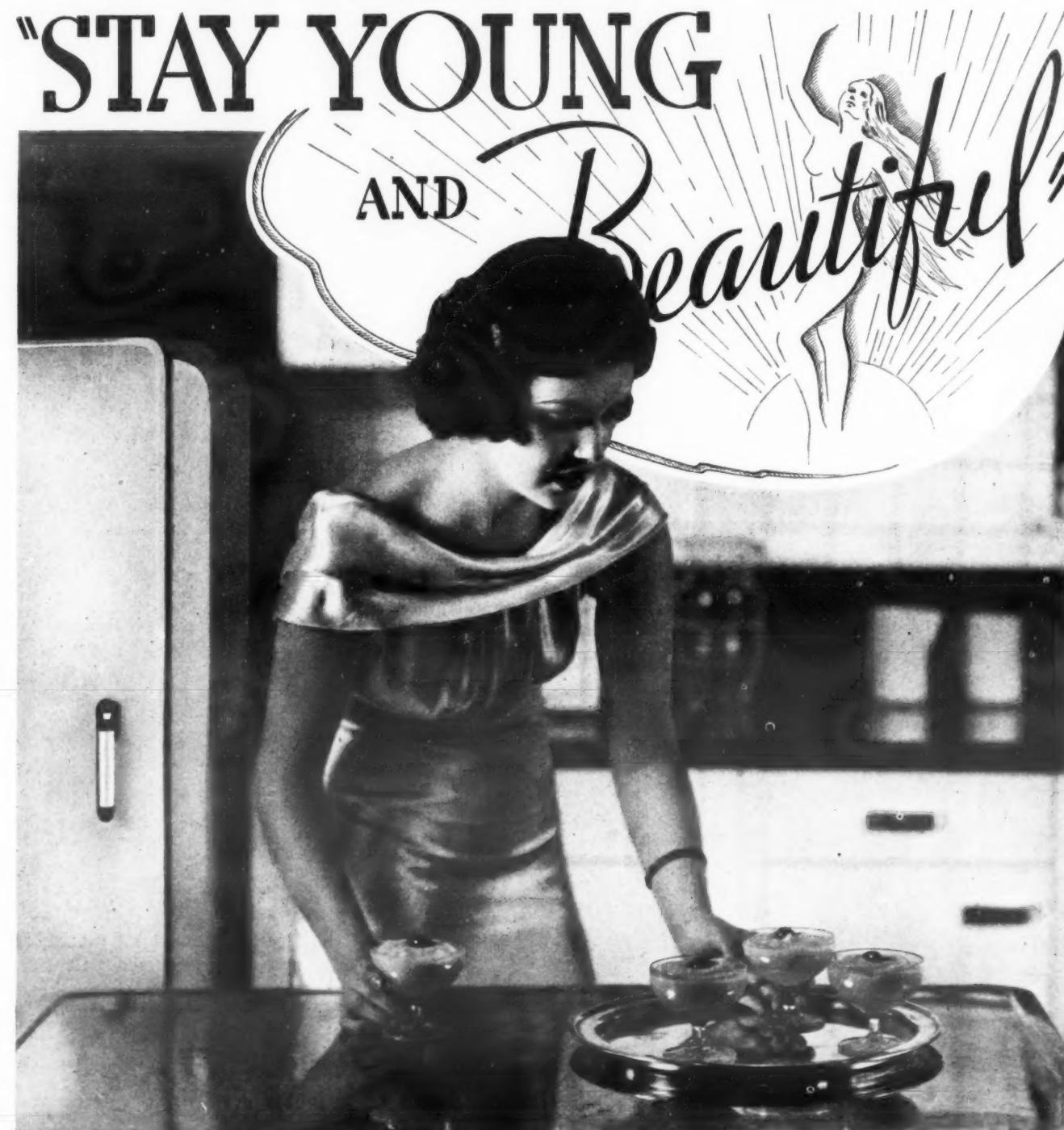
"But," he added, "general styling seems to be the most important consideration in the minds of most prospective customers these days. The unit itself also is playing an increasingly important role in refrigerator sales," he continued. "We have to have our quota of gadgets, of course, because the public has come to consider them an essential part of any refrigerator."

At the display of Ryal's, Inc., Ed Van Sweringen bemoaned the price raise which had gone into effect on most refrigerators during the early portion of the show.

"The price should have been kept down until the end of the show, anyway," he declared. "When a customer who has been here earlier in the show returns to find that the refrigerator he looked at then now costs \$10 more," Mr. Van Sweringen said, "the sale is usually killed right then. But in spite of the price raise," he continued, "refrigeration is going big."

Mr. Van Sweringen was another of those who pointed to gadgets as the basic sales appeal of refrigerators.

Attendance, which at the ninth day of the show stood at over 221,000, more than doubled that of the 1936 show, Mr. Frost reported. Dollar volume of floor sales is expected to be more than 250% above that of last year's exhibition, although no actual comparison is possible due to the fact that 171 firms exhibited this year, compared to the 91 exhibitors at the 1936 show.



And she will, too, thanks to modern science. Among the many miracles of today, none plays a more important part in "making life easier" for the modern woman than automatic refrigeration, with its easy-to-make frozen deserts, ice-cubes, and other conveniences.

In this trouble-saving industry, Virginia Smelting has done its share to bring it to its present perfection. ESOTOO and V-METH-L are widely used as refrigerants by the leaders in the refrigerating field. The purity and complete dryness of these refrigerants insure trouble-free operation and lasting life. Both ESOTOO and V-METH-L are available for immediate delivery from 72 distributing points here and abroad.



VIRGINIA SMELTING CO.
WEST NORFOLK, VIRGINIA

**AIR CONDITIONING AND
REFRIGERATION NEWS**

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Catching 'Em Young

TEACHERS at the University of Wisconsin are poisoning the minds of their students against advertising and business, it is declared in the March 1 issue of *Advertising Age*. In the first of a series of surveys of college teaching with reference to advertising, this periodical reports that students are taught that advertisers put "pressure on the consumer to buy merchandise he doesn't need and can't afford."

Consumers Research, Inc., is recommended as authoritative by some instructors, it is further revealed. Two of the university's faculty, Professors Edward Alsworth Ross, chairman of the department of sociology and anthropology, and Richard W. Husband, assistant professor of psychology, have embodied their anti-advertising ideas in textbooks which have national use in schools and colleges.

Charges Advertisers Control the Press

Prof. Ross, for instance, in his "Principles of Sociology," declares that newspapers are not free to tell the truth, because advertisers dominate their editorial policies.

This theme is further developed by Prof. Husband, who writes:

"Newspapers . . . are supported and hence directed by their advertisers. When a newspaper does not even dare publish news which it would otherwise feature, because the individual involved happens to be an official of an advertising firm, how could we expect facts unfavorable to the product, the truthfulness or the business policy of the same firm to receive an accurate report?"

Truth Must Be Admitted

Before attempting to answer these criticisms, or trying to devise a method of counter-attack against the undeniably subversive effect upon youthful minds of these

criticisms of business and advertising, it might be well to admit that there has been a measure of truth in the above accusations, especially in the past.

Advertisers have attempted to control the press, and all too often have succeeded in doing so. Even the News has been subjected to two advertising boycotts by a group of manufacturers who objected to its independent editorial policy. Both of these boycotts, while costly, were survived without lowering the banner or changing the policy.

Demonstrates Need for Independent Press

The subject is brought up here only as evidence that misguided advertisers sometimes do attempt to control the press, just as other misguided advertisers hang a black eye on the entire advertising fraternity by indulging in over-emotional appeals and exaggerated copy, buying testimonials, and engaging in other dishonorable practices.

This sort of thing makes it difficult to demonstrate to the educators, and to advertising's professional critics, that enlightened advertisers agree with enlightened publishers that only through an independent press which is clearly recognized by the public as such can goods or services be sold to the awakened audiences of today.

Influence Based on Confidence of Readers

Truth in reporting and fearlessness in editing attract and hold readers as nothing else will. To publications founded on this belief and its practice, advertisers eventually gravitate; because they realize that in the columns of such periodicals their messages will carry the most conviction, as well as having the assurance that therein *they will be read*.

Prof. Grant Hyde, director of the school of journalism, said in the above-mentioned survey:

"If the advertising world will do its job right and behave itself, it won't need a defender. The advertising associations have accomplished a great deal. The clean-up of advertising in the past two years is comparable to that accomplished in the period from 1905 to 1910."

Advertising Does Need a Defender

Unfortunately, right now advertising does need a defender, and so does business in general. As he points out, it first is necessary that business and advertising keep their skirts clean. But more than that, the public must be told about it.

As the News pointed out editorially Feb. 10, public relations have suddenly assumed the important position in American industry which they have long deserved.

Because industry has too long neglected the matter of selling itself and business thinking to the public at large, well-planned attacks from many quarters have had an inordinate amount of success.

Public Should Be Able To Identify Scarecrows

Demagogues have seized upon Big Business as a new dragon to slay, and thus win votes. And now the educators seem to be at work undermining the buyers of tomorrow.

Business needs to be interpreted, to be humanized, by specialists in

public opinion. A new note of frankness needs to be interjected into the picture. Industry needs to police its own ranks to get rid of the miscreants. And above all, the public should be educated as to the real place and purpose of business in American life, so that the scarecrows which are being erected by the demagogues and pedagogues may be recognized as such by more enlightened voters and buyers.

Why Prices Go Up

FOR the first time in several years, the refrigeration industry's retail price curve is going up.

This is not a move decreed by stockholders who want larger dividends; for even if executives of the industry were the plunderers of the public purse which politicians are painting them to be, they know full well that the market for household refrigerators is getting down into lower and lower income brackets, and that prices really should be reduced if volume is to be maintained and increased.

But the executives cannot help themselves. Costs of materials and labor are mounting steadily. The keen competition which prevails in this industry has already reduced profit margins of maker and seller to such narrow limits that rises in production costs must inevitably be followed by price increases.

Higher Wages Mean Higher Prices

That's one thing which the militant labor agitators of today do not seem to take into consideration: higher wage scales mean higher prices, and up goes the cost of living.

Whether or not the laborer will gain anything in *real wages* (i.e., what he can buy with his pay), as the result of the nation-wide agitation apparently inspired by the New Dealers, remains to be seen.

Already the makers of automobile tires have announced one 6% increase in prices, to be followed by another 6% jump in a few weeks—both necessitated by rising labor charges. This is but one of the staples used by every working man which has had to boost prices in recent weeks as a result of rapidly mounting costs.

Last year the man of average and small means learned what the Administration's program to augment farm income means in terms of higher prices for food.

Short-Sighted Labor Agitators May Be Disappointed

It may be that all this pressure to increase incomes will have a beneficial effect upon the nation's economy, even though it does appear, theoretically to be an attempt to lift oneself by one's bootstraps. On the other hand, Henry Ford may be stating the true principle when he says that competition really controls wages, rather than bickering between union officials and management.

It may also turn out that rising prices will so reduce demand that America will be forced back from its ascent of the hill of prosperity, and start sliding downward again. In any event, it does seem that those who agitate for increased incomes all along the line are likely to be disappointed in what they get in the end, even though they may be successful in winning their demands today.

You can't get something for nothing.

- LETTERS -

Mr. Jones Wonders about Some 'Cool-Aire' Claims

683 33rd St.
Des Moines, Iowa

Editor:

Having been informed that your organization is the one of whom I may obtain the information I wish, I am writing for an answer, if available and convenient to you, of the following questions.

Please give me information as to the manufacturer, and location of factory and executive offices, of the air-conditioning equipment marketed under the trade-name "Cool-Aire."

Is "Cool-Aire" equipment recognized and accepted by the air-conditioning industry? Is it a fact that "Cool-Aire" self-contained units made up 38% of the world sales, the year 1936, in that particular field? Send me all available information in regard to "Cool-Aire" equipment.

I will appreciate any information you may be able to send me. As "Cool-Aire" air-conditioning equipment, both unit coolers and central systems, have been eulogized to me and I have seen no mention of that particular trade-name in the copies of AIR CONDITIONING AND REFRIGERATION NEWS which a business friend has so graciously loaned to me from time to time, I am wondering as to the merit and industrial recognition of the equipment as it would be applied in all types of installations.

C. C. JONES.

Answer: We cannot give you very much information about the "Cool-Aire" or the firm which makes it. We understand it is an assembled unit, sold by the Nomis Oil Burner Co., 410 Lingle Ave., Lafayette, Ind.

This firm has not answered correspondence which we have addressed to them, and has ignored our request for specifications of their equipment. We understand, however, that they have a plan for granting "states rights" to jobbers in various parts of the country.

There is no statistical data, or other information that would indicate that "Cool-Aire" accounted for any substantial portion of world sales of self-contained units.

Sales of Electrolux Units Are Not Made Public

RCA Radiogram
Sydney, Australia

Feb. 25, 1937.

Cockrell-Detroit:

Gas company here advertising that more than one-third refrigerators sold New York are Electrolux. Is this statement correct? Please cable advice.

F. C. LOVELOCK, Ltd.

Answer: Locklove-Sydney (via RCA) Telephoned Louis Ruthenburg, president, Servel, New York (manufacturer of Electrolux refrigerators) who says statement not authorized and no comparative statistics available. Electrolux does not release sales figures.

Mr. Old's Interest in Kold-Hold Not for Sale

Kold-Hold Mfg. Co.
Olds Tower Bldg., Lansing, Mich.

Feb. 20, 1937.

Editor:

Various rumors have been set in motion, presumably by those who seek to profit thereby, to the effect that R. E. Olds, major stockholder of the Kold-Hold Mfg. Co., is seeking to sell his interest in the company.

Mr. Olds' controlling interest in the Kold-Hold Mfg. Co. is definitely not for sale. Nor does the company anticipate the licensing of its products to any other manufacturers.

CHARLES E. ECKER, President.

Nix on Foreign Foods

4248 Juniper St.
Tower Grove Sta.
St. Louis, Mo.

Subscription Dept.:

The enclosed \$3.00 Express Money Order is for renewal of my subscription when it expires Apr. 30, 1937.

Enjoy and get some good out of each issue.

I went "Around the World" with your interesting Editor George F. Taubeneck, but could not eat all of the foreign foods that he did.

Would like to read his description of the interesting cities, states, etc., of our own United States.

WALTER A. KLEIN

Answer: Reader Klein will find what he asks for in the files of ELECTRIC REFRIGERATION News from July, 1930, to July, 1933, during which time the editor was writing his impressions of American cities under the heading, "An Editor on Wheels."

Among the cities covered were New York, Chicago, Detroit, Cleveland, Cincinnati, Dayton, Mansfield, Evansville, St. Louis, St. Paul, New Orleans, Indianapolis, Atlanta, Kansas City, Portage, Wis.

Atlantic City, Milwaukee, Buffalo, and Grand Rapids.

Smaller communities on the list included Middletown, Ohio; Kendallville, Ind.; Miami, Fla.; Beloit, Wis.; Marshall, Ill.; Fort Madison, Iowa; Greenville, Mich.; Belding, Mich.; Butler, Ind.; Cambridge, Mass.; Keokuk, Iowa; Champaign-Urbana, Ill.; Bloomington, Ill.; French Lick, Ind.; Mitchell, Ind.; and Greencastle, Ind.

In addition to cutting his travelog eye-teeth on stories about these American cities, Editor Taubeneck warmed up for the reporting of his world tour with detailed accounts of what he saw and heard in Cuba and Bermuda.

Some Subscribers Object To Unrequested Mailings

Western Union Telegram

New York, N. Y.

March 2, 1937.

Business News Publishing Co.:

Wire cost of addressing and mailing 10,000 return postal cards to subscription list.

JOHN B. GALLAGHER CO.

Answer (Via Western Union): Our policy against making unrequested mailings to subscribers, based upon complaints received in past Red Book plan designed to meet needs of advertisers desiring such service and to avoid criticism of subscribers who consider it a breach of faith to sell their names.

Porcelain Tubs Used On Kelvinator Machines

Porcelain Enamel Institute

612 N. Michigan Ave.

Chicago, Ill.

Editor:

In your story regarding the new washing machine line introduced by Kelvinator for 1937, in your Jan. 13 issue, there is a statement that has caused some confusion in my mind.

In the middle of the last column on page 4 there appears this statement:

"Tubs of 24-inch diameter and 20-gallon capacity are on the higher-priced models, while on the lower-priced machines the tubs are slightly smaller and do not have the 'Permalux' finish."

In reading this over several times the inference seems to be that most of Kelvinator's 1937 washers will have tubs finished in the so-called "Permalux" finish. I wish you would put us right on this, for I believe, upon investigation, you will find they are using porcelain enameled tubs.

GEORGE P. MACKNIGHT,
Managing Director.

Answer: Officials of Nash-Kelvinator's laundry equipment department advise us that all of the Kelvinator tubs are finished in porcelain both inside and out, and that the Permalux finish is used on all other parts, such as the skirt, legs, and wringer.

Better and Better

Bill's Ramblin' 'Lectric Shop

Ashkum, Ill.

Feb. 17, 1937.

Editor:

Here is a money order for \$5. Please extend my subscription for two more years.

The 5 was hard to part with this time of year, but as your magazine is getting better and better each issue I feel that it is the best investment I can possibly make in my education.

If I was rich I would gladly pay \$5 a year for so helpful and interesting a magazine.

Have you reserved a Red Book for me?

W. FLORENT FRONVILLE.

Filling the File</h

Carrier Builds Equipment to Condition Egyptian Capitol

NEWARK—Water from the Nile River in Egypt will be used in the Carrier air-conditioning system now being installed in the Assembly Hall of the Parliament of Egypt in Cairo, by Carrier-Egypt S.A., an affiliate of the Carrier Corp.

Announcement of the order for the 112-ton Carrier centrifugal machine and air-conditioning system for year-round use was made recently by Herbert L. Laube, vice president of Carrier-Brunswick International Division. The system will be in operation for the coming session of Parliament.

The Carrier installation includes a cooling tower which uses city water direct from wells supplied by the historic Nile, said Mr. Laube.

The equipment will be made in the Newark plant of Carrier Corp. and shipped to the Egyptian capital for assembly and installation.

THE AIR AGE

BY F. O. JORDAN

Who Does What?

The imminent threat of a 100% organized condition of the building trades resulting from the rapid and apparently irresistible administration-backed growth of labor unions, hurls into the limelight a question already great in the worlds of air conditioning and refrigeration.

The burning question—

Who is to install the refrigerant lines?

Every air-conditioning and refrigeration man knows full well that the installation of the refrigerant system holds serious problems all its own, and fully realizes that the performance of the entire system is completely dependent upon a thorough understanding and proper solution of such problems.

Some problems—

1. One hundred percent elimination of moisture and air from the refrigerant system. The presence of moisture and/or air will impede seriously the functioning, and may stop altogether the operation of the entire system.

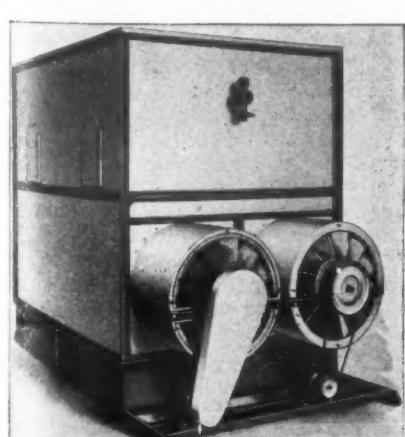
2. Complete avoidance of gas-binding and oil-trapping, as the former will stop all refrigerating effect, while the latter will result in burned-out bearings and wrecked refrigerating machines.

3. Absolute prevention of refrigerant leaks, for such leaks soon put an end to all refrigerating effect, and frequently have been known to cost several hundred dollars per day in lost refrigerant.

4. Testing of refrigerant system by safe methods. Many lives and much property already have been lost by mistakes.

The past has proven the tragic absurdity of employing, for the installation of refrigerant piping, men who are untrained in refrigerating practices, even though they may

BINKS TOWERS SAVE MONEY!



Indoor Forced Draft Type

FORTIFY yourself on the water consumption & disposal problem which is becoming more difficult. In many sections, MAINS (both supply & disposal) are becoming inadequate as industries demands for water increase.

Use BINKS TOWERS! They give constant recirculation and cut water bills as much as 80%.

Write for Bulletin 70 Today!

BINKS MANUFACTURING CO.
3114-40 Carroll Ave., Chicago.

experts in another type of pipe fitting.

In recognition of the complete dependence of air-conditioning and refrigerating equipment upon the proper fabrication of the arteries through which the life-blood of the refrigeration system flows, hundreds of thousands of dollars have been spent in the special training of thousands of specialized artisans for such work.

But now, in the face of the knowledge born of the sad experience of an entire industry, it is reported that the steamfitters have decided to take over the right to perform this highly specialized work, the problems of which differ from theirs as the problems of the polar seas differ from the problems of life in the equatorial jungles.

While we cannot assume the prerogative here of questioning the right or even the advisability of the steamfitters' unions to assume jurisdiction over the refrigeration fitter, certainly it would react for the untold benefit of everyone concerned, in the event that the steamfitters should succeed in taking this momentous step, for them to create a new department within themselves for the men already trained—or who may be trained—in the highly technical and specialized art of fitting refrigeration equipment and piping, and to permit only such artisans to perform the work of refrigeration fitting.

It seems that here is an outstanding opportunity for unionism to make a name for itself before Public Opinion either as an indispensable aid to Advancement, or as the dog in the manger of Progress.

Or, should the refrigeration fitters form a separate union of their own—or should they belong to a union at all?

Surely, with a problem of such importance to Capital and Labor alike, and of so controversial a nature, there must be plenty of fixed opinions.

Send your ideas in for publication in this column. They will interest others as well as you—and may lead toward the settlement of a serious question in time to prevent grave trouble.

* * *

The Stoker Show

Alias the Detroit Builder's Show—"Stokers, Stokers, Everywhere," seems to be the motif of the 1937 Builder's Show decorative scheme, where the crowds charge bravely onward unmindful of stokers to the right of them, stokers to the left of them—except where there are oil burners.

Now and then is a daring exhibit where there is no stoker, while several exhibitors appear to have neither oil nor gas burners. But the thought of the day seems to be the automatic heating of the great American home sweet home, the thought generally being wrapped up in some form of direct-fired "air-conditioning" (heating to you) unit.

Only one manufacturer offers anything that could be called an exhibit of air conditioning of the summer comfort variety, although three or four other concerns have granted storage space amongst their stoker burner exhibits for a lonely room cooler to while away a few hours of oblivion.

Judging from the equipment shown at the show, the visitor from Mars certainly would assume residential cooling to be only a dream-child of future earthlings, with no useful relation to the commercially-minded present. Probably the dearth of home-cooling exhibits is merely the unconscious reflection on the oft-expressed thought that "residential cooling will not be here for five—or maybe ten—years." Probably the lagging sales volume of residential all-year air conditioning is but a reflection of this lackadaisical thought also, for as the Chinese so sagely say, "as the child thinketh, so doeth he when he is old."

Seriously, one cannot help but wonder just how much this next-five-or-ten-year mental hazard is to blame for the reluctance of Miss Home-Cooling, the well known sleeping beauty, to wake up and start somewhere.

* * *

Long Range Forecasting

Because of the Ohio Valley flood disaster, the movement for scientific long range weather forecasts initiated last year by the Nash-Kelvinator Temperature Research Foundation

now is receiving enthusiastic backing from everything up to and/or down from governors to scientific and industrial leaders. From the railroads, the air lines, the manufacturers, and even from the army, such expressions come in.

Typical quotations:

Governor Davey (Ohio): "This is a matter that requires Federal action. I am in full sympathy with the project and suggest that you immediately contact our Senators and Congressmen."

Governor Earle (Pennsylvania): "It will be impossible to properly operate flood control works without such service, as the storage and release of waters from flood control reservoirs must be governed by predictable flood stages."

City Manager Dykstra (Cincinnati): "Certainly by this time science can come to our aid and give us a little longer warning of what may happen in those areas where floods are a constant menace."

Mayor Washburn (Paducah): "Present experience is proof of necessity."

General Harbord: "It does seem to me that with adequate advance warning much could be accomplished in the prevention of the loss of life and property."

This tremendous awakening of public lethargy results from the terrible disaster in which more than 400 lives were lost. Yet we hear of no mutterings of unrest concerning the 3,500 deaths which resulted from heat prostrations during July and August of last year, the majority of which might have been prevented by a more general use of air conditioning.



Aerofin Light-Weight Fan System Heat Exchange Surface is the first choice of leading architects and engineers because of its proven efficiency.

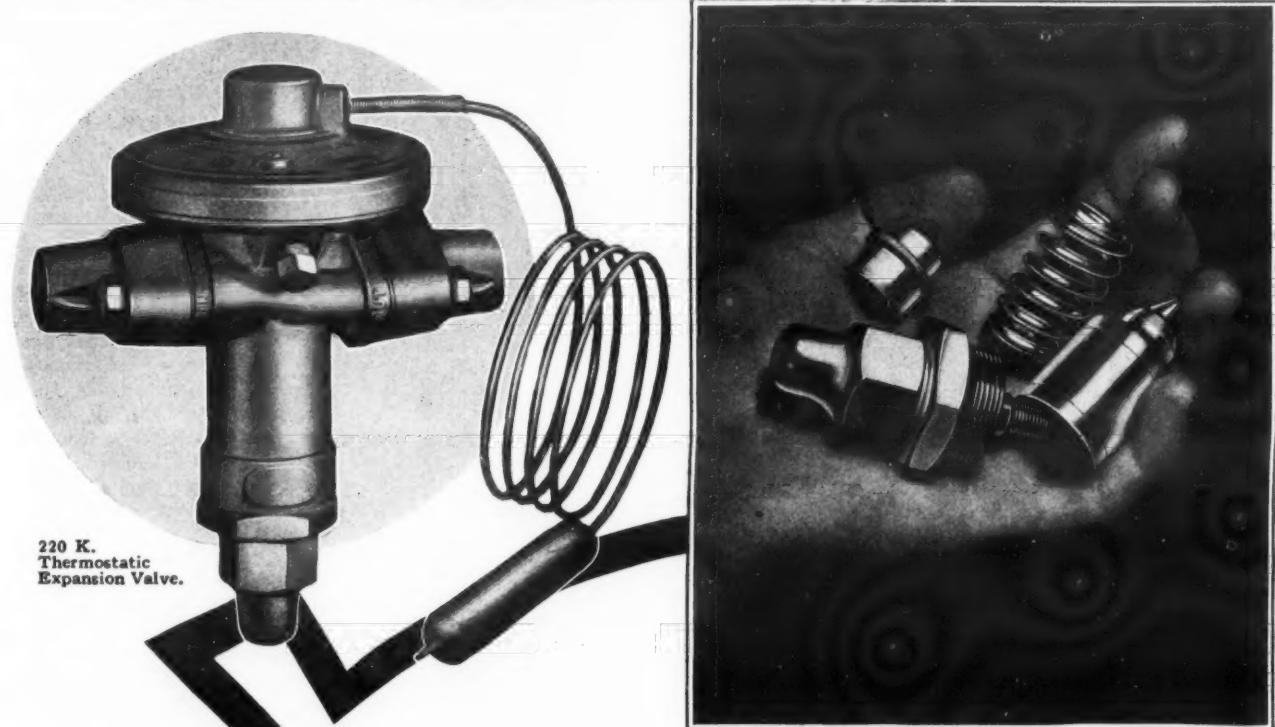
Over 45 Million Feet now in use.

Let us solve your Cooling problems. Our engineers will give prompt, personal and efficient technical cooperation.

Write to address below.

AEROFIN CORPORATION
NEWARK, N.J.

"Aerofin is sold only by Manufacturers of nationally advertised Fan System apparatus."



A-P Expansion Valves are easy to disassemble and clean



Each part of an A-P Expansion Valve is designed and built to produce a perfectly working unit. All working parts are easily removed for inspection and cleaning.



AUTOMATIC PRODUCTS COMPANY

2450 NORTH THIRTY - SECOND STREET

MILWAUKEE



WISCONSIN

Progressive Jobbers everywhere stock A-P Controls.

HOW TO SELECT AND INSTALL AIR-CONDITIONING SYSTEMS

By T. H. Mabley, Chief Engineer,
Mechanical Heat & Cold, Inc., Detroit

Case No. 6

A Coffee Shop

In this application problem we consider a small coffee shop, noting certain points that are typical for similar installations.

The coffee shop is situated on the ground floor of a commercial building and occupies only the one floor. The space above, below, and on both sides is used by other tenants and so restricts the design to a system which will be kept entirely in the tenant's space.

The problem is one of summer cooling and adequate ventilation. At the present time an exhaust fan is used to ventilate the space from a grille located in the wall between the kitchen and the dining room and above the pantry.

The pantry has a much lower ceiling than the dining room and thus leaves a space above the pantry ceiling. It is in the partition that the present exhaust grille is located.

The present system of ventilation is inadequate for at least two reasons. First, not enough air is handled by the present exhaust fan to properly clear the air of tobacco and cooking odors, and second, the only method of bringing in the air to replace that which has been exhausted is by the front door or transom above it. This

arrangement causes drafts of air which are objectionable to customers seated near the door.

While the original and most important reason for installing an air-conditioning system in this establishment is for the purpose of providing cooling and dehumidification of the air during the summer months, the item of ventilation must be considered as a very important factor.

From the standpoint of performance we select a 15° temperature differential between indoor and outdoor dry bulb temperatures when the outside temperature is 95° dry bulb and 75° wet bulb. The most desirable and still economical indoor relative humidity in this case is 50%.

To arrive at some figure for ventilation is a matter of approximation. It would be foolish to figure on attempting to keep the air completely clear of tobacco smoke and food odors at the point of maximum occupancy, as this would increase our cooling load to a point where the first cost as well as operating cost would be much too high.

The peak load of occupancy is reached only for a period of about an hour at noon time and at supper time, and it is intended to slightly reduce the proportion of ventilation load during this peak period. Before and after the peak, the fresh air per person might run as high as 30 to 35 c.f.m.

STANDARD REFRIGERATING APPLIANCES

New Valves

SMALL IN SIZE . . .
. . . BIG IN PERFORMANCE



TYPE "F"

AUTOMATIC EXPANSION VALVES

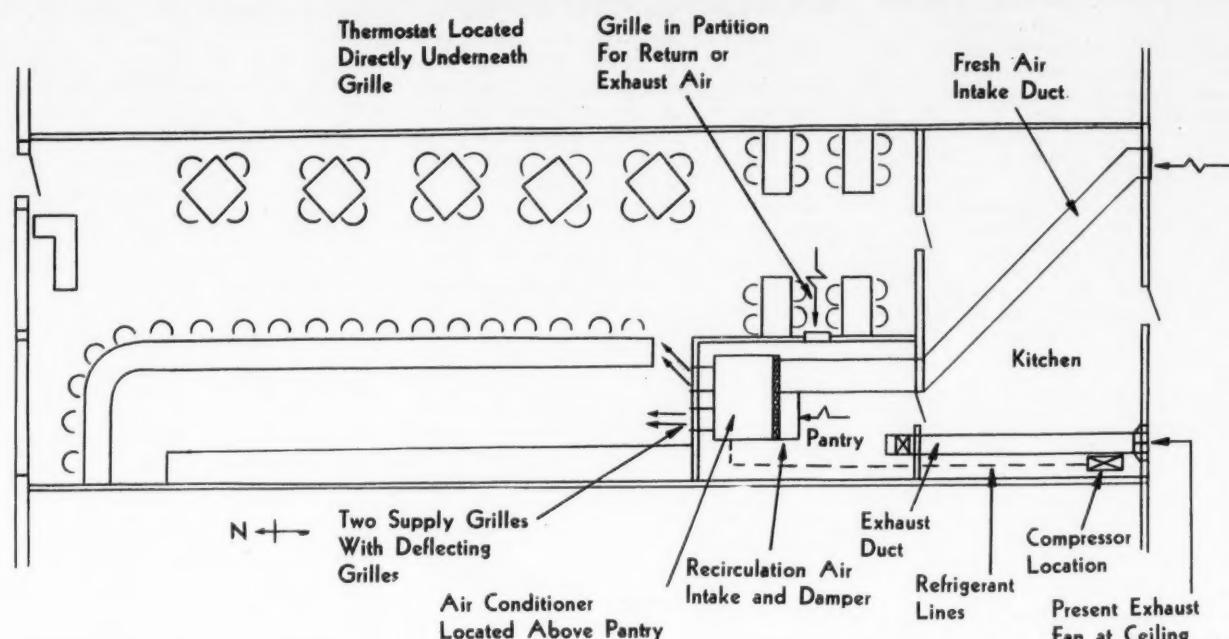
These valves are especially designed for the smaller units—domestic cabinets—beverage coolers—water coolers—room coolers—ice cream cabinets. Bodies of these valves are hot pressed die forgings, close grained and non-porous. The springs are extra length for smooth, velvety adjustments. Needles are special alloy, adaptable for any refrigerants. The breather cap is of live rubber with threaded metal insert. And these are just a few of the many outstanding construction features of these superior valves. No. 1582, 1/4" S.A.E. inlet—1/4" F.P.T. outlet. No. 1583, 1/4" S.A.E. inlet—1 1/4" bolt centers. Type "F" valves are interchangeable with all refrigerants except ammonia.

Write for bulletins on the complete line of Blue Ribbon Appliances.

AMERICAN INJECTOR COMPANY
RILEY ENGINEERING CORP. Associate

1481-14TH ST. • Phones LAFAYETTE 0350-0552 • DETROIT, MICH.

Layout for Installation in Small Coffee Shop



In checking our calculations we note also that in basing our quantity of fresh air on a basis of so much for each person we get a figure higher than the normal infiltration. At the peak load point we have 3 air changes of fresh air per hour.

The item of air cleaning should not be neglected in this case. While we have failed to mention it as an important function it still must be considered in the design of this system, as the coffee shop is located in a congested business district and the air brought in from the rear of the building, in particular, is laden with dust and smoke. Filters should be considered also for the protection of the fixtures and light-colored decorations, as well as for general cleanliness.

Likewise the function of circulation has an important place, particularly in this type of business where objectionable drafts may result, more quickly than in most any other business, in complaints from customers. At the same time the circulation must be adequate to give an even distribution of temperature throughout the conditioned space.

Having established our performance functions and limits let us now make a heat gain calculation as shown in the accompanying table.

It may be noted that the temperature difference between the conditioned space and other adjacent occupied areas was slightly reduced. This, of course, is debatable and naturally depends upon the conditions in the adjacent space.

In this connection for the kitchen partition a 25° temperature difference was used, which is 10° higher than normal outside temperature.

The amount of heat thrown off by the heat-generating appliances may likewise be questioned because no complete and reliable data have been published to date concerning this factor, and we must take approximate average figures as well as a good guess at the proportion of latent and sensible heat to use for the coffee urns.

In some cases it often is advisable to use an additional figure of 40 to 70 B.t.u. per person for hot food served. However, in this case we can disregard this item because the service in this shop consists of light lunches and more of a soda fountain type business. Furthermore, some leeway has been allowed in the selection of a number of persons for the load estimate.

After making a study of the physical condition of this space it is decided to place a single unit above the pantry space and carry the pantry partition to the ceiling to conceal the unit and supply a plenum for recirculation and exhaust air.

A unit having the required capacity is selected and this unit should have cooling coils and filters in addition to the necessary blower and motor. The supply outlets are connected directly to grilles which are primarily designed for high velocity diffusion as well as for the proper deflection of air to give the best distribution.

It may be observed that it will be necessary with this arrangement to provide a large circulation of air so as to assure adequate temperature distribution particularly at the front and rear of the conditioned space. The compressor may be located in the kitchen storage space and the refrigerant piping carried along the wall.

Most important feature of this system is the proper control of air mix-

Heat Gain Calculations

SENSIBLE HEAT

Conduction Load:

	B.t.u.
Floors—1,865 sq. ft. x .46 x 12°	10,295
Ceiling—1,865 sq. ft. x .30 x 12°	6,714
Rear partition—327 sq. ft. x .34 x 25°	2,780
Side partitions—1,105 sq. ft. x .34 x 12°	4,508
Front windows—180 sq. ft. x 1.13 x 15°	3,051
Front wall—80 sq. ft. x .45 x 15°	540
Fresh Air—20 c.f.m. per person x 60 persons would require 1,200 c.f.m. which is equivalent to three air changes per hour. 1,200 c.f.m. x 1.03 x 15°	18,540
Occupancy—60 people x 220 B.t.u.	13,200
Appliances:	
Two coffee urns x 4,000 B.t.u.	8,000
One toaster 2,000 watts x 3.4 B.t.u.	6,800
Lights—3,000 watts x 3.4	10,200
Total Sensible Heat	84,628

LATENT HEAT

Fresh air—1,200 c.f.m. x .64 x (98—76) grains

Occupancy—60 people x 180 B.t.u.

Appliances—two coffee urns x 3,000 B.t.u.

Total Latent Heat

Total Heat Load

33,896

118,324

tures. Under some conditions it is necessary to provide a large quantity of fresh air for ventilation and perhaps cooling by ventilation. And on the other hand, there are times when the temperature may be very high outside, and the operator will not want to bring the temperature of the space to a comfortable condition during a time that the occupancy load is fairly low, in which case only a small amount of fresh air is necessary.

For the Air-Conditioning Distributor-Contractor

This is No. 6 in the series, "How to Select and Install Air-Conditioning Systems" by T. H. Mabley, chief engineer for a Detroit air-conditioning distributor.

Drawing on his experience with this and other contracting firms Mr. Mabley outlines the procedure in selecting and installing equipment for specific applications, and discusses any special features of the job which may be involved.

Previous articles in this series have been published as follows:

Case No. 1, A Single Office (Jan. 6);

No. 2, A Conference Room (Jan. 13);

No. 3, Residence System with Room Cabinets (Jan. 20);

No. 4, Typical Commercial Application—A Shoe Store (Feb. 3);

and No. 5, A Beauty Parlor (Feb. 24).

A very flexible but easily regulated arrangement for the regulation of the system in this manner should be provided.

First of all the present exhaust connection is revamped to provide a connection into the pantry as well as an opening into the conditioner plenum space above the pantry. A splitter damper is installed between these two openings so that by movement of this damper air may be drawn from either the pantry or the plenum space.

This damper is so located that as it opens one opening it begins to close off the other and the movement of this damper is accomplished by a chain regulator carried over the necessary pulleys to the control point on the wall between the kitchen and pantry. At this same point is located the present speed regulator for the exhaust fan.

To this control position is also brought another chain control which will regulate the portion of fresh and recirculated air which enters the conditioner. This chain also leads over the necessary pulleys provided to clear corners to a pair of dampers located in the back of the conditioner.

One of these dampers is located

in the return air intake, and the other in the fresh air intake duct. Each damper is of the multilouver tight-fitting design and is sized to pass the full volume of air handled by the conditioner at a velocity not to exceed 1,000 ft. per minute. For this case the conditioner handles 4,800 c.f.m. so that each set of dampers should have approximately 5 sq. ft. or more free area.

The two dampers are interconnected by a linkage in such a manner that as one damper opens the other closes so that at the extreme positions of the chain control the operation can get either 100% fresh air or 100% recirculated air.

With this arrangement of equipment the grille located in the side wall of the span above the pantry will be used either as a recirculation grille or as an exhaust grille, and under some conditions it might be used as both. The ceiling of the pantry should be insulated with some form of insulation such as 2 inches of mineral wool to reduce the heat gain through the warm pantry ceiling.

The regulation of the dampers may also be done automatically by means of a temperature control system whereby the proper thermostatic controls would be located in the recirculated air stream, the fresh air intake and possibly other essential points. These thermostats would control the necessary damper motors to perform the functions outlined for the manual control.

However, in this particular case the purchaser would probably prefer the manual operation for various reasons, one of the reasons being that no control has been yet satisfactorily produced to detect and then regulate the smoke and objectionable odor conditions in the conditioned space. When the air conditions become uncomfortable in the room the operator in this case will adjust the proper dampers by means of the chain regulator.



Kansas City, Mo., Installations

The following data, supplied by the Kansas City Power & Light Co., shows where air conditioning was installed in Kansas City during 1936. Figures on installations for all previous years were published in the Feb. 26, 1936, issue of the NEWS.

- AIR CONDITIONING SURVEYS -

Where Installed	Equipment and Installer	Tons	H.P.
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Banks

City Bank and Trust Co.	Frigidaire (Carter-Waters)	35	35
Commerce Trust Co.	Frigidaire (Carter-Waters)	10	11½
First National Bank	Airtemp (C. A. Flarsheim)	20	26
Inter-State National Bank	Carrier (Gustin-Bacon)	20	25
Mercantile-Home Bank & Trust Co.	Westinghouse (Natkin Co.)	20	30
5 Installations		105	127½

Beauty Shops

Marie Earle Beauty Salon	Carrier (Gustin-Bacon)	5	5½
Eva O'Donnell	Carrier (Gustin-Bacon)	2½	3
John Taylor's Beauty Shop	Carrier (Gustin-Bacon)	17	23½
3 Installations		24½	32½

Drug Stores

Katz Drug Co.	Lipman (Gen'l Refrig.)	30	40
President Hotel Pharmacy	Lipman (Gen'l Refrig.)	10	12
2 Installations		40	52

General Offices

Boyle-Prior Construction Co.	York (York Ice Mach.)	5	5
Brown & Strauss	Baker (Copeland Refrig. Co.)	7½	7½
Columbia Hog & Cattle Products	Frick (B.D.R. Materials)	4½	5
Crawford Mfg. Co.	Kelv. (Richards-Conover)	5	5½
Ford Motor Co.	York (York Ice Mach.)	37	40
Fox Film Co.	Westinghouse (Natkin Co.)	15	20
Fox Midwest Theatres	Uses present equipment.		
Hirsch Distillery	Carbondale (Natkin Co.)	5	6
Hobson-McFarland Tractor	Frick (By Owner)	3	5½
K. C. Fire & Marine Ins.	Carrier (Gustin-Bacon)	45	71
K. C. Power & Light Co.		25	0
K. C. Wholesale Grocery Co.	Airtemp (C. A. Flarsheim)	20	25
Katz Drug Co.	Westinghouse (Natkin Co.)	7	7½
Linwood Ice Cream Co.	York (York Ice Mach.)	7½	7½
Lowe & Campbell	Carrier (Gustin-Bacon)	25	38
Midwest Film Dist. Co.		15	17
Missouri Loan Co.	Westinghouse (Natkin Co.)	7	8½
Rodney Milling Co.	Copeland (Copeland Ref. Co.)	3½	5
R.K.O. Distributing Corp.	Carrier (Gustin-Bacon)	15	17
Sheffield Steel	G-E (Gen. Air Cond. Corp.)	45	60
Speas Mfg. Co.	Frigidaire (Carter-Waters)	10	12
Waxide Paper Co.	York (York Ice Mach.)	18	20
Fred Wolferman, Inc.	York (York Ice Mach.)	25	28½
York Ice Machine Co.	York (York Ice Mach.)	5	5
24 Installations		360	416½

Hospitals

Bell Memorial Hospital	Strang (McNamara)	1	1
Menorah Hospital	Airtemp (C. A. Flarsheim)	2	3½
Mercy Hospital	G-E (Gen. Air Cond. Corp.)	3	3
Research Hospital	Westinghouse (Natkin Co.)	1	1
Research Hospital	Westinghouse (Natkin Co.)	30	38
St. Luke's Hospital	York (Goetze Dist. Co.)	½	¾
St. Luke's Hospital	Strang (McNamara & Co.)	3	3
St. Mary's Hospital	Westinghouse (Natkin & Co.)	½	¾
8 Installations		41	50½

Hotels

Commonwealth Hotel	Frigidaire (Carter-Waters)	2	2½
Muehlebach Hotel (Guest and Ball Rooms)	Carrier (Gustin-Bacon)	90	127
Pickwick Hotel	York (York Ice Mach.)	75	100
President Hotel (bar)		7½	11
4 Installations		174½	240½

Miscellaneous

City Hall (Court Rooms)	Carrier (Gustin-Bacon)	40	40
Fortune Skill Ball Salon	Westinghouse (Natkin & Co.)	30	38
K.C. Club (Private Rooms)	Carrier (Gustin-Bacon)	7½	8½
K. M. B. C.	York (York Ice Mach.)	23	25
The Paddock	Frick (B.D.R. Materials)	13	15
Rialto Club	Frigidaire (Carter-Water)	7½	7½
St. James Church	Baker (Gen. Maint. Co.)	10	12
Snooker Club	Frigidaire (Carter-Waters)	20	25
Ace Stanfil	Coolair	½	½
9 Installations		151½	171½

Mortuaries

C. H. Blackman & Sons	Strang (McNamara & Co.)	5½	5½
Morton's Funeral Home	Airtemp (C. A. Flarsheim)	3	4
D. W. Newcomer's Sons	G-E (Gen. Air Cond.)	35	35
Quirk & Tobin	Carrier (Gustin-Bacon)	10	11
Stine & McClure	Westinghouse (Natkin Co.)	40	50½
5 Installations		93½	106

Restaurants & Night Clubs

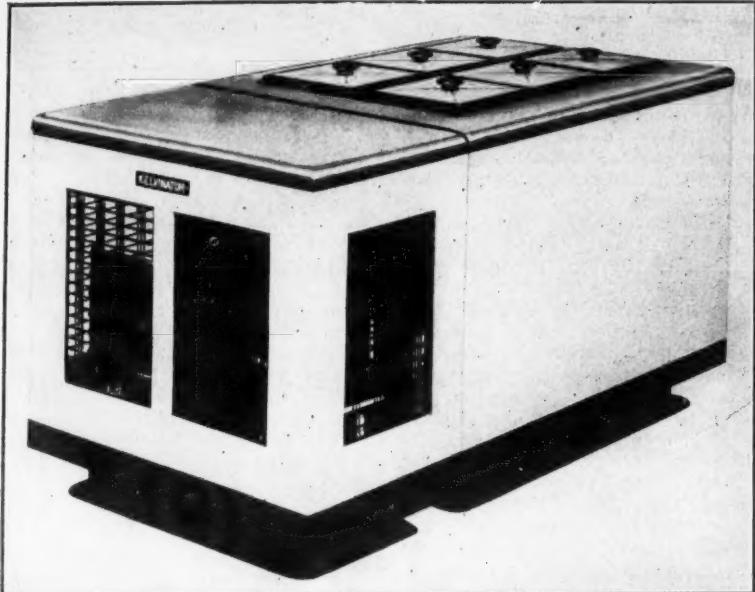
Beaman's Lunch	Servel (Copeland Refrig.)	2	3
Blankenship's Lunch	Copeland (Copeland Refrig.)	4	6
Brewer's Tavern (Robert)	Copeland (Copeland Refrig.)	2	3
Blue Bird Cafeteria	Airtemp (C. A. Flarsheim)	10	11½
Engleman's Cafe	Curtis (Greenwood's, Inc.)	5	5
Film Club	Universal (Cool Air Dis. Co.)	3	3
Myron Green's Cafeteria	Servel (Paris Refg. Sales)	7½	7½
Hale's Cafe	Kelv. (Richards-Conover)	4½	5
Keithley's Grille	Curtis (Greenwood's)	5	5½
Martin's Tavern	Frigidaire (Carter-Waters)	10	10
Morris Delicatessen	York (York Ice Mach.)	8	10
Portland Liquor Co.	York (York Ice Mach. Co.)	20	24½
Railway Exchange Cafeteria	Westinghouse (Natkin Co.)	7	8½
Romanelli Grille	Frick (B.D.R. Materials)	13	16
Screenland Cafe	Lipman (Betz)	10	10½
Silcott's Restaurant	Baker (Wording)	25	26
State Line Tavern	Copeland (Copeland Refg.)	7	7
Tip Top Cafe (LaGalle)	Kelv. (Richards-Conover)	4½	5
Valerie's Cafeteria		25	28
Wachter's Restaurant	Carrier (Gustin-Bacon)	15	17
Werner Plaza BarbQ	Lipman (Gen. Refrig.)	15	20
21 Installations		202½	232½

Sales Rooms & Shops

Allen Shoe Store	Westinghouse (Natkin & Co.)	16	22
Baer Dress Shop	Westinghouse (Natkin & Co.)	15	19½
Baker Shoe Store	Westinghouse (Natkin & Co.)	14	19
Baker Shoe Store	Carbondale (Natkin & Co.)	10	11½
Lee Bell	Carbondale (Natkin & Co.)	5	6
Emery Bird Thayer	G-E (Gen. Air Cond.)	3	3
Goldman Jewelry Co.	Westinghouse (Natkin & Co.)	20	28
Gray Jewelry Co.	Airtemp (C. A. Flarsheim)	3	3½
Halper's Exclusive Millinery	Brunner (Betz)	5	5½
Kresge's 10¢ & \$1.00 Store	Carrier (Gustin-Bacon)	250	350
Mindlin's	Westinghouse (Natkin & Co.)	15	20½
Mindlin's	Westinghouse (Natkin & Co.)	10	12
Rothcholds & Sons (Fitting Room)	Carrier (Gustin-Bacon)	7½	8½
Schoenhard's	G-E	3	3
Swanson's Dress Shop	Carrier (Gustin-Bacon)	15	16½
Wilde-Steinbacher Fur Co.	Howe (Air Con. Eq.)	5	5
16 Installations		396½	533

Private Offices & Residences

(See Summaries in Column 3)			
Offices—Private—36 installations		44.75	63
Residences—101 installations			

One of Kelvinator's New Ice Cream Cabinets

Kelvinator 6-hole portable holding cabinet.

**Kelvinator Offers
7 New Ice Cream
Cabinet Models**

DETROIT—Kelvinator's 1937 line of ice cream cabinets, just announced by the company, comprises seven models—three Kelvin Chests and four portable holding cabinets.

The cabinets, built to meet the "revealed needs" of ice cream manufacturers and distributors, are finished in white. Portable holding cabinets are equipped with Monel metal tops, and new grilles.

Recessed steel girder bases enhance eye appeal of the units, as well as adding to their sturdiness.

Attention has been given to extra storage capacity in all models in the 1937 line.

The standard four-hole Kelvin Chest has a bulk capacity of 15 gallons, and a packaged goods capacity of from 24 to 26 gallons. Square sleeves in every model insure more room for packaged items.

Units have been designed to occupy a minimum of floor space, and the height has been changed so as to facilitate servicing, Kelvinator engineers assert.

Four inches of cork insulation is used in all models. Compressors have also been redesigned, to cut current cost and running time.

Simplicity also has been stressed in the new units. For all seven models there are only two motors and two compressor blocks, reducing the number of spare parts and consequent servicing problems, it is claimed.

The four portable holding cabinets in the new 1937 Kelvinator line are of 12, 8, 6, and 4-hole capacity, combining remote control with a portable type cabinet. The three Kelvin Chests are of 4, 3, and 2-hole size, the largest chest having two 5-gallon and two 2½-gallon sleeves, and the medium chest one 5-gallon and two 2½-gallon sleeves.

- COMMERCIAL REFRIGERATION -**Smith & Lagatella Join G-E
Commercial Division**

CLEVELAND—Walter P. Smith and Richard Lagatella have been added to the commercial refrigeration division of General Electric Co. Mr. Smith's work will consist primarily of distributor organization. Mr. Lagatella will be connected with the promotion of water-cooler and beverage-cooler sales.

Mr. Smith joined G-E's warehouse and distribution division in 1928. Later he was moved to the product division. More recently he has acted as sales manager of the Atlanta district.

Mr. Lagatella comes to G-E's commercial division from Ochiltree Electric Co., Pittsburgh. While with that distributorship, he set an admirable record as water-cooler specialist, G-E officials declare. Recently he has been connected with commercial sales activity in relation to dealers.

**Gloekler Completes Pittsburgh
Market House Installation**

PITTSBURGH—Gloekler Mfg. Co., maker of commercial refrigeration equipment, has completed a \$90,000 installation in the new municipally owned Market House here.

All refrigeration, display equipment, counters, and paneling in this modern new market was designed, built, and installed by Gloekler Mfg. Co. The market covers an area of 40,000 sq. ft., and contains 103 individual stands, many of which required specially designed refrigerators and display cases.

**Gustafson Named Servel Outlet
In South Dakota Territory**

SIOUX FALLS, S. D.—E. J. Gustafson has been appointed distributor of Servel commercial refrigeration equipment in South Dakota and adjacent counties in the states of Minnesota and Iowa.

**Johnson Bronze Issues New
Motor Bearings Catalog**

NEW CASTLE, Pa.—Johnson Bronze Co. has just issued a catalog showing its complete line of electric motor bearings.

More than 200 bearings are individually illustrated and described in the catalog, and all necessary specifications are furnished. Alphabetical, progressive, and numerical size listings of bearings for any type motor are incorporated to facilitate reference.

The company offers a consulting service through its staff of engineers and metallurgists, to aid in solving bearing problems.

**Matthews Engineering Co. New
Dallas Contracting Firm**

DALLAS—Matthews Engineering Co., recently organized refrigeration contracting firm, has opened for business at 2026 Ross Ave.

Mr. Matthews served as manager of Central Engineering & Supply Co., local Frick distributor, for 10 years before deciding to enter business for himself.

**Danforth Makes Unusual
Installations in Pittsburgh**

PITTSBURGH—Danforth Co., local Westinghouse dealer, has made several out-of-the-ordinary commercial installations recently, reports C. O. Emrich, sales manager of the commercial division.

For instance, the company installed a ½-hp. open type unit on "The Captain," McGrady-Roberts river dredge, to preserve the food and cool the drinking water for 34 men who practically live aboard the dredge.

Mr. Emrich himself designed the florist display box in Hatch Flower Shop, and then equipped it with a ½-hp. air-cooled hermetic unit.

Danforth Co. installed 2-hp. and 3-hp. Westinghouse units for East Liberty Electroplating and Refinishing Co. Both units are used to cool the water in tanks for anodizing and coloring aluminum.

Two Westinghouse water coolers, back to back, supply 14.6 gallons per hour of 50° F. water to men of Carnegie Institute of Technology.

At the bar of Mike Capone, kin to Al, a 1½-hp. water-cooled condensing unit refrigerates tap box, beer pre-cooler, food refrigerator, three bottle coolers, and the cocktail box.

**200-Locker Storage Plant
Established at Shawnee**

SHAWNEE, Okla.—The first cold storage locker in this locality has been established here by the Zero Locker Storage Co., of which J. Liebmann is manager. Two hundred lockers have been installed and the plant has a capacity for 170 more.

**Jan. Kelvinator Commercial
Shipments Up 238%**

DETROIT—January shipments of Kelvinator commercial refrigeration units showed an increase of 238% over those for the corresponding month in 1936, declare company officials.

**Selling Refrigeration to the Small-Town
Merchant Requires Showing Him How It
Will Help His Business, Armstrong Says**

LUBBOCK, Tex.—To sell commercial refrigeration equipment to the small-town merchant, you've got to study the problem from his angle and show him how much it will help him in his business, says E. H. Armstrong, owner of Armstrong's, commercial dealership here.

Mr. Armstrong sold about \$30,000 worth of commercial refrigerating equipment during 1936, and the greater part of this volume was with small town and village merchants.

"The average prospect in a town the size of Lubbock and larger, knows quite a bit about electric refrigeration as applied to his own business," Mr. Armstrong points out, "and in selling him, it is a matter of selling him on your individual line and service, and not so much on refrigeration in general. He more or less understands his refrigeration problems, through his own study and what he has been told by refrigeration salesmen."

"But that is not, on the average, true of the small town and country merchant. He is considering electric refrigeration for the first time. He doesn't know what it will do for him; he doesn't know how to figure out his own refrigeration problem. It's up to the dealer who hopes to sell him to take over the prospect's problem and work it out from the most elementary stages right through to the sale. That is the principal we have been following—and it has paid us."

The company employs two salesmen on this line; and Mr. Armstrong devotes a lot of his time to small-town and rural prospects.

When a representative of the firm is convinced in his own mind that the merchant is a genuine prospect (he already has checked his credit rating, so that he knows what sort of a deal he can offer), he makes a close survey of the various phases of the business. He checks the volume of business done on lines requiring refrigeration, the size and shape of the store, and other problems entering into the selection of proper refrigeration equipment.

With this information at hand, he then tells the prospect what he needs to enjoy adequate refrigeration. He stresses the importance of electric refrigeration, the savings to be effected through properly refrigerating merchandise requiring it, the value of the system in building and holding business, and talks generally on the fundamental reasons for refrigeration.

tion. The talk is elementary, as compared to sales talk to a prospect in a larger town, because the dealer knows little or nothing about the subject.

After he has shown the prospect what his business requires in refrigeration, he gets down to prices and terms.

Service facilities provide a good selling argument in talking to out-of-town prospects, Mr. Armstrong finds; and he and his salesmen stress the firm's 24-hour service to all commercial customers. Each customer receives a card bearing instruction on how to phone for service at night.

The firm finds small-town and rural prospects largely by actual contact. Going from store to store in a small town requires only a short time, and it usually uncovers from one to several prospects, Mr. Armstrong finds. Direct mail advertising aids in selling the merchant on the firm's line and services, after his name gets on the prospect list.

"We believe the small town and the rural community with high-line power represents by far the greatest market for commercial refrigeration today," Mr. Armstrong declares. "It is rather difficult, we find, to over-work the possibilities—because the field has been under-worked."

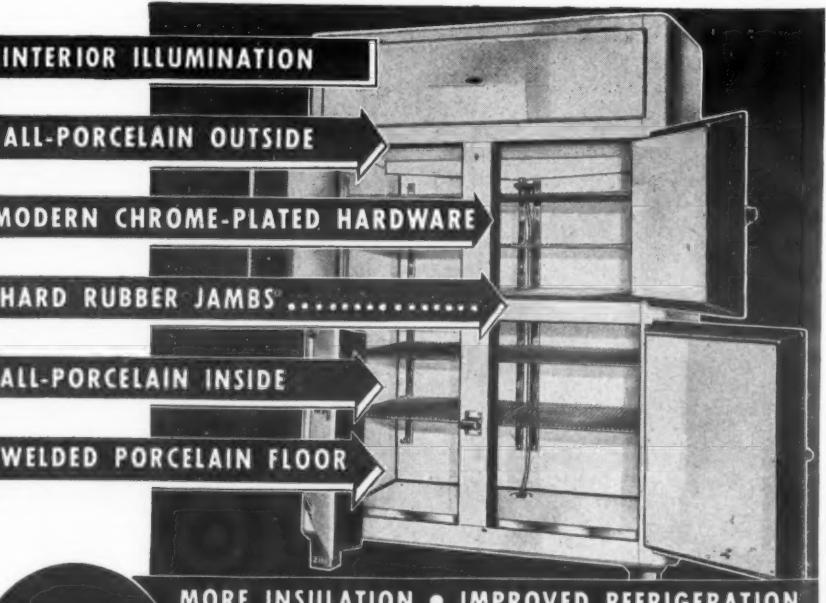
**Counter Freezer Makers Appeal
District Court's Ruling**

WASHINGTON, D. C.—New measures have been taken by counter freezer manufacturers to compel the Federal Trade Commission to investigate allegations that the International Association of Ice Cream Manufacturers and certain large individual ice cream makers endeavored to obtain legislation restricting the operation and sales of counter freezers.

An appeal to the U.S. Circuit Court of Appeals for the District of Columbia from a ruling of the Federal District Court here, which denied a writ of mandamus asked by the counter freezer men, is the latest step taken by the manufacturing group.

**Virginia Court Grants Writ of
Error in Counter Freezer Case**

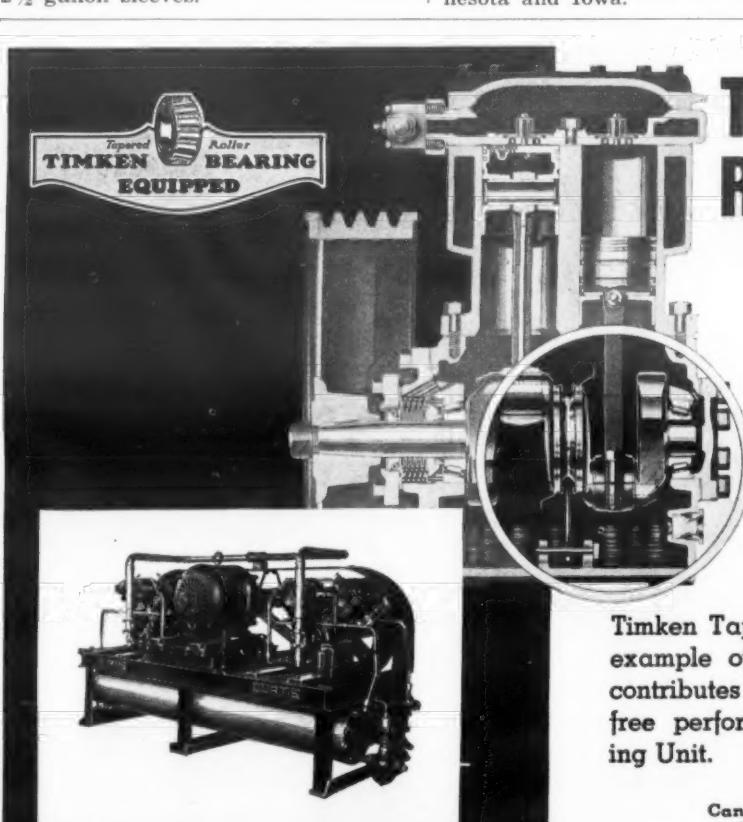
RICHMOND, Va.—The Supreme Court of Appeals of Virginia recently granted a writ of error in the case of Robertson vs. Commonwealth, for interfering with the operation of a counter freezer. The case is being prosecuted by the Counter Freezer Association.

**HILL REFRIGERATORS**

Hard commercial use in hot kitchens makes the best Reach-in Refrigerator the most economical—the least costly to operate, the longest lived, and the most convenient. That is why Hill Reach-in Refrigerators are easier to sell to hotels, restaurants, hospitals, institutions and bakeries.

● Send for 32-page illustrated catalog, using your business letterhead.

HILL PRODUCTS DIVISION
C. V. HILL & CO., INC., TRENTON, N.J.



CURTIS

Holcomb & Hoke Add Two Models to Meat Display Case Line

INDIANAPOLIS — Holcomb & Hoke Mfg. Co. recently added two new models to its line of refrigerated meat display cases—the "Mastercase," a streamlined all-porcelain case with deluxe features, and a lower priced model, the "Business Builder."

Available in 8, 10, 12, and 14-ft. lengths, the Mastercase models are 50 inches high and 35½ inches wide. The cabinets are equipped with oversize cooling coils of the automatic defrosting type.

Features of the Mastercase model include an air flow controller, or insulated section separating the top display from the bottom storage; plate glass mirror ends; an adjustable, sectional mezzanine shelf; an adjustable cast iron scale shelf and paper cutter; and 4 inches of insulation. The case contains a full set of platters for displaying meats.

Dimensions of the Business Builder line are: height 50 inches, width 33½ inches, lengths 6½, 8, and 10 feet. Cabinet top finish is of porcelain, the remainder being finished in Porcelike, a Holcomb & Hoke developed finish.

Interior finish of the top display compartment is of porcelain; bottom storage compartment is finished in white enameled copperbearing galvanized steel.

Three-inch-thick insulation is used in the Business Builder case. It contains extra heavy duty type cooling coils.

Legg Foresees Record Sales of Replacement Ice Cream Cabinets

DETROIT—Many thousand outmoded ice cream cabinets will be replaced by new and larger cabinets this year, believes Edward R. Legg, national direct sales manager for Kelvinator division, Nash-Kelvinator Corp.

"From the low of 9,000 units sold in 1933, the present upward trend should mount to record total replacement sales in 1937," Mr. Legg stated.

"The 20% increase in national ice cream sales during the first eight months of 1936 over the previous year, coupled with the large replacement needs, indicates that cabinet demands in the coming year will far exceed those of recent markets."

CONDENSERS • EVAPORATORS

FOR EVERY MODERN APPLICATION

Quality and efficiency are the outstanding features of Long condensers and evaporators. Condenser units of tube and flat continuous fin construction, in copper and steel, give maximum heat dissipation per pound of material used, and collect less dust. Available in both domestic and commercial units for electric refrigeration and air conditioning applications.

LONG MANUFACTURING DIVISION
BORG-WARNER CORPORATION

DETROIT, MICHIGAN
WINDSOR, CANADA

LONG

Brine Spray Air Washer Conditioning System Maintains Low Temperatures in Hide Storage Room of Canadian Tannery

KITCHENER, Ontario — Low-temperature air conditioning installed in the hide storage of the Lang Tanning Co. here proved itself a good investment in last summer's operation.

This installation is an unusual one, because it includes the problems of maintaining the unusually low temperature of 28° F. within a room 220 ft. long by 60 ft. wide into which warm hides are taken at the rate of nine carloads per week.

The hide storage is a new room recently formed by excavating a 12-foot cellar under the present building, and by installing four-inch corkboard on the inside of all floors, walls, and ceilings. Obviously, the conditioned space is quite well protected from outside temperatures and sun effect, so that the major portion of the load is due to storing the large quantities of warm hides which must be cooled quickly and maintained at sub-zero temperatures.

The air-conditioning system is arranged as follows: the air supply is taken from the storage room, is cooled and dehumidified by means of a brine spray air washer, and is delivered back to the storage room through an overhead supply duct by a No. 10 "CL" Canadian Blower and Forge fan which delivers 35,000 c.f.m. against a static head of ¾ inches of water. The supply duct extends the full length of the storage room, and is provided throughout its length with the necessary horizontal air discharge outlets.

The air washer is a No. 10 "C" Buffalo unit which measures 8 ft. by 13 ft. by 6 ft. overall dimensions, is constructed of copper-bearing galvanized iron, and is provided with 300 iron spray nozzles. The air washer is supported above a welded brine tank which is 20½ ft. long by 6 ft. wide by 5 ft. high. Submerged within this tank is a Frick shell-and-tube brine cooler 16 inches in diameter by 15 ft. long. Ammonia control is by means of No. 1½ Frick float valve.

The brine is held at 15° F., and is circulated through the cooler and sprays by a 300 g.p.m. pump which is driven by a 7½-hp. motor. The pump suction is taken from a 2 ft. by 4 ft. by 4 ft. brine mixing tank which is sunk into the floor of the engine room.

The refrigeration effect is obtained from an 8 by 8 ammonia compressor which is driven at 300 r.p.m. by a 50-hp. motor, and from a 16 inches by 18 ft. multipass condenser.

Compressor and condenser are so proportioned to each other that with condensing water as obtained from a spray pond, the head pressure does

not go above 170 lbs.

The condensing water is cooled by a spray pond which is 30 ft. wide by 40 ft. long, and is provided with ten 1½-inch Binks spray nozzles which have a total capacity of 225 g.p.m. of water. The maximum water temperature off the pond was 84° F. during the maximum outside air dry bulb temperatures of last summer. However, no comparison between water off and outside air wet bulb temperatures are available.

During the maximum load conditions of the past summer, the maximum operating time of the refrigerating equipment proved to be eight hours, while operating time was but 50% of that figure during hot weather when no hides were added.

Upon one occasion the air-conditioning plant was shut down for a period of 45 hours during which time three carloads of hides at 76 degrees were stored. Although, by the end of this period, the storage room temperature had risen to 52°, but 12 hours were required after the equipment was placed back in service to reduce the room temperature to 28° F.

Avery Engineering Occupies Larger Quarters

CLEVELAND — Avery Engineering Co., distributor in Northern Ohio for Carbondale Machine Corp., has taken additional office space and increased its sales personnel to handle increased business in refrigeration and air-conditioning equipment.

Officials report that 1936 business exceeded that of 1935 by 30%.

First Installation of York's New Heat Exchanger Made in Atlantic City Dairy

ATLANTIC CITY, N. J.—First installation of York Ice Machinery Corp.'s new style plate type heat exchanger, introduced at the Dairy Industries Exposition last fall, has recently been completed for Supplee-Wills-Jones Milk Co. here, where a model DHS double pedestal unit is operating on a milk-to-milk regeneration and final heating cycle.

The unit is handling 10,000 lbs. of milk per hour, one section operating with hot water to heat the milk up to a final temperature of 145° F. for its 30-minute pasteurization period in the insulated holding tank, and the other section operating regeneratively (1) to heat the raw milk from 40° to 120° for entrance into the heating section, and (2) to cool the pasteurized milk down from 145° to 65° F., at which temperature it enters the refrigerated cooler.

While the installation is too new to furnish much in the way of operating data on the new heat exchanger, the following advantages are claimed for the equipment:

LOWER PRESSURES

First, pressures are much lower than in former equipment because the friction of fluids passing through has been materially reduced. Milk, and the heating or cooling medium, flow is in a broad shallow film over the entire smooth surface of the plates.

The plates are arranged so that by-passing is eliminated, and completely wetted surfaces are assured.

Thus a relatively slow rate of flow, with a high heat transfer, is attained, requiring a minimum of pressure for movement of the liquids.

Another advantage of the new models is their compactness, occupying considerably less space than former units of comparable capacity.

CONSTRUCTION OF UNIT

The new heat exchanger is an assembly of smooth, die-pressed, stainless steel plates with grooves on both sides which form passages for the two fluids between which the exchange of heat is effected. The plates are supported in a cast iron frame, with movable heads which can be loosened for cleaning and sterilization with either steam or hot water.

The primary advantage claimed for the plate heat exchangers is their economies of milk-to-milk regeneration, which are said to save 75% or more of the cost of fuel and refrigeration needed for pasteurization.

Also, the units are said to be highly sanitary, providing a completely closed cycle, and eliminating splash losses and evaporation.

Three models are available in the new line, all adapted to service in milk-to-milk regeneration, heating, cooling with either water or brine, or high temperature-short time pasteurization.

The heat exchange units can be arranged for any capacity, and when required can be increased simply by the addition of plates.

ANACONDA COPPER REFRIGERATOR TUBES

are Unusually

.... Easy to bend
and flare

Anaconda Copper Refrigerator Tubes have exactly the qualities you need to give the best value in installation jobs.

These quality tubes are exceptionally soft. They lend themselves to easy bending and may be flared without cracking. They are thoroughly dehydrated to free them from moisture on the inside and the ends are sealed to keep them dry. And, even though they are made of 99.9% pure copper, they are specially deoxidized to increase their corrosion-resistance.

Anaconda Copper Refrigerator Tubes are manufactured according to A.S.T.M. specification B68-33 by methods which assure unusually bright, clean inside surfaces. They come to you absolutely free from chips and dirt.

Anaconda Copper Refrigerator Tubes meet the leading manufacturers' specifications for tubes to be used in installation work. They are carried in stock by leading Refrigerator Parts Distributors.



Cutaway view of inside of tube. The inside surface is bright and clean—no dirt, no chips.

ANACONDA
COPPER REFRIGERATOR TUBES

FRENCH SMALL TUBE Branch
THE AMERICAN BRASS COMPANY • General Offices: WATERBURY, CONNECTICUT

Commercial Service Manual

On this page is a continuation of Chapter 7 of the COMMERCIAL SERVICE MANUAL by K. M. Newcum, author of the popular MASTER SERVICE MANUAL.

A summary of the previous installments follows:

Chapters 1 and 2 were omitted from the News, as they are of basic material which has previously been covered in the paper, but they will appear in the completed book.

Chapter 3, Cylinders, Valves, and Safety Devices for Refrigerants—Aug. 5, 12, and 19.

Chapter 4, Methods of Transferring Refrigerants to Smaller Cylinders—Aug. 19.

Chapter 5, Drying of Refrigerants—Aug. 26.

Chapter 6, Commercial Condensing Units—Sept. 2, 9, 16, 23, 30; Oct. 21; Nov. 4, 11, 18, 25; Dec. 2, 9, and 16.

Chapter 7, Evaporators and Refrigerant Control Valves—Dec. 23, 30; Jan. 6, 13, 20, 27; Feb. 3, 10, and 24.

Century Pamphlet Describes Repulsion-Induction Motors

ST. LOUIS—Century Electric Co. has issued a new pamphlet describing its line of single phase, repulsion start-induction run motors.

The pamphlet lists and explains the various features of these motors, especially those pertinent to self starting, torque and current, fusing, the governor, the brush-lifting mechanism, the short circuiting device, and insulation tests.

Illustrations and specifications of several models and their various parts are also given in the pamphlet.

COMMERCIAL REFRIGERATION SERVICE

Structure and Operation of Snap-Action, Two-Temperature Valves

CHAPTER 7—Evaporators & Refrigerant Controls (Cont.)

BY K. M. NEWCUM

Snap-action two-temperature valves offer a third method of controlling temperatures in a duplex flooded evaporator installation. The application and need for the snap-action valve is the same as for the automatic regulating type.

The major difference is that as the name implies the snap-action valve opens and closes with a snap and may be adjusted to maintain a definite pressure cycle in the control evaporator, both on the cut-in and cut-out.

A Fedders snap-action valve is shown in Fig. 133. Arrows indicate

the direction of the flow through the valve.

Operation of the valve is as follows: the pressure from the controlled evaporator responds on the bellows, and as this pressure increases the bellows moves upwards or contracts against the pressure of the main spring inside the bellows. With this slight movement the valve does not open, as the balance spring located immediately above the seat holds the seat tightly closed.

As the pressure increases it finally reaches the set cut-in point, at which

point the push rod has moved upward sufficiently far to cause the toggle arms to be snapped upward against pressure of valve differential adjustment springs.

When the toggle snaps upward, the valve lifts off the seat, allowing the full pressure from the controlled evaporator to flow to the compressor and low-pressure control.

During the on cycle, the action is reversed in that it remains wide open, until by a gradual reduction in low side pressure the bellows elongates,

Fedders Control

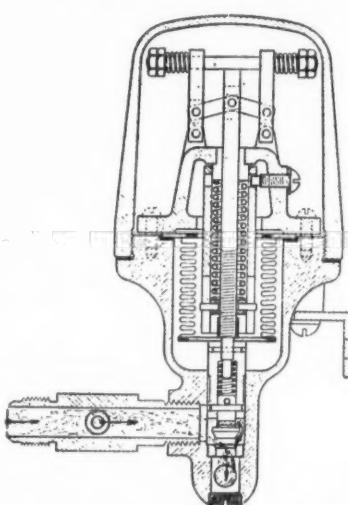


Fig. 133—Fedders snap-action valve, with arrows indicating direction of refrigerant flow.

and travels downward until the set cutting-out point is reached, at which point the toggles snap downward and the valve snaps closed.

The snap-action valve, then, allows for an independent cycle on the controlled evaporator.

For an example: the uncontrolled evaporator may be operating at 10 lbs. cut-in and 10 inches of vacuum cut-out on the low-pressure control. The snap-action valve may be used to control another evaporator at any other pressure range within the adjustable limits of the valve. Remember always to control the condensing unit with the coldest evaporator.

The Barostat snap-action valve is shown in Figs. 134 and 135. It employs a diaphragm to provide the movement necessary in opening and closing. The main adjustment is at top and should be screwed up or counter clockwise for a colder setting and down for a warmer setting.

The differential adjustment is at the bottom of the valve. To increase the differential turn stem to right and vice versa.

Later Barostat valves have an opening for installing a gauge to be used when making adjustments.

The proper evaporator connections may be clearly noted in Fig. 134.

The Frigidaire snap-action two-temperature valve is shown in Fig. 136. This valve is set at the factory for a cut-in pressure of 10 inches and cut-out pressure of 10 inches of vac. (SO₂).

The cutting-out pressure may be lowered by turning adjusting nut "C," Fig. 136 down or counter clockwise. The cutting-in adjustment or pressure may be increased or decreased by turning adjusting nut "H."

The two small nuts "F" are compensating nuts and are to be used only in case of very fine adjustments. This valve is designed for a range of settings between 18 lbs. and 3 lbs. cut-in, and 8 inches and 20 inches cut-out (SO₂).

Where flooded evaporator temperatures vary several degrees and require the use of two-temperature valves, it is also recommended that a good sensitive check valve be used in the suction line or lines of the colder evaporators.

During the on cycle of a duplex system using constant pressure, auto-

Drawing of Barostat Snap-Action Valve

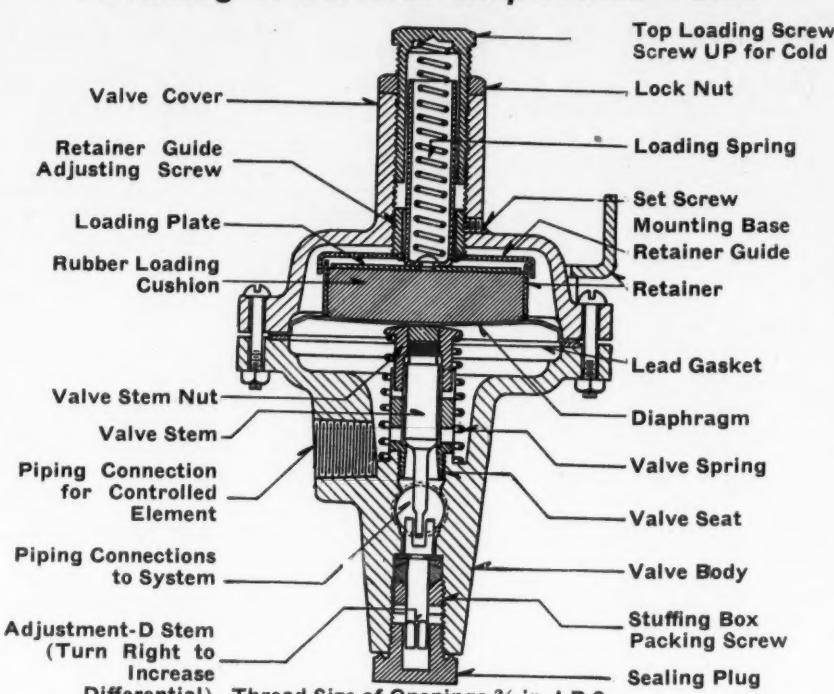


Fig. 134—Diagram of structure of Barostat snap-action valve, with all important parts named.

Barostat Valve



Fig. 135—Barostat valve with cover in place, and bracket for mounting.

Frigidaire Valve

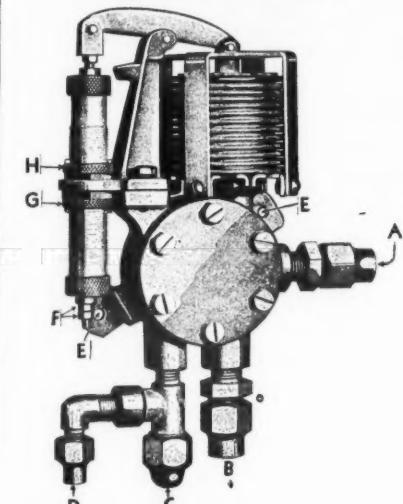
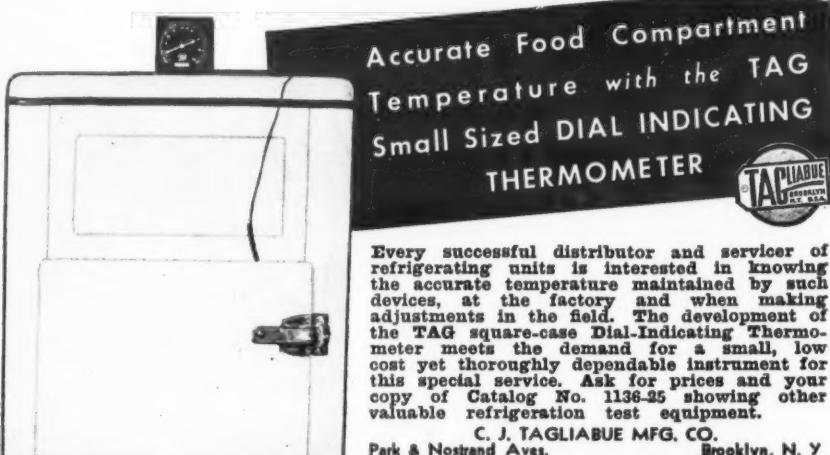


Fig. 136—Frigidaire snap-action two-temperature valve. (A) Connection to coil. (B) Connection to compressor. (C) Standard valve. (D) Gauge connection. (E) Holes for supporting valve. (F) Compensating nuts. (G) Cutting-out adjusting nut. (N) Cutting-in adjusting nut.

direction of the flow of suction gas is to the compressor. During the off cycle the warmer fixtures will cause the pressure to build up more rapidly than in the colder fixtures and evaporators. This higher pressure gas from the warm or warmer evaporator will travel via the suction line to the colder evaporators and where the temperature

(Concluded on Page 21, Column 1)



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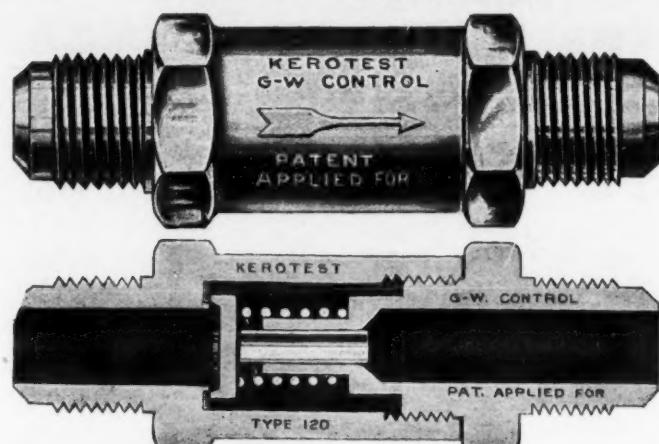
Kerotest Check Valve

Fig. 137—Kerotest G-W control (check) valve. Arrow shows direction of refrigerant flow

Necessity for Use Of Check Valves In Suction Line(Concluded from Page 20, Column 5)
ture difference is sufficient, will condense therein.

This causes two undesirable conditions. First, it may overflow the colder evaporators causing them to frost back at the start of the on cycle; and second, it directs the pressure away from the pressure control and results in erratic operating cycles.

With a check valve installed in the suction line of each of the colder evaporators, any pressure or refrigerant leaving the warmer evaporators

will be checked against entering the colder evaporator and therefore must respond on the pressure control causing it to cut in at the proper time.

The use of a check valve is also recommended in conjunction with snap action valves. Although a snap action valve provides an independent cycle, its operation is affected by other factors.

For example, assume that the snap action valve is closed and the compressor has just completed its cycle on the colder evaporator; when the snap action valve opens, the hot gas thus released may pass into the colder evaporator and not start the compressor, thereby allowing the compressor to remain off until the combined pressures of the warmer and colder evaporator have reached the

set cut-in point to start the compressor.

In such a case, undesirably high temperatures would result in the controlled evaporator and fixture. By installing a check valve in the suction line of the colder evaporator as near the evaporator as possible, the higher pressure gas released from the snap action valve would be checked against entrance to the cold evaporator and would be directed to the pressure control, thus starting the compressor at the proper time.

Check valves then should be installed in all suction lines except the highest temperature ones.

A Kerotest GW control (check) valve is shown in Fig. 137. The arrow shows the direction of the refrigerant flow from the evaporator to the compressor. The operation of the valve is that when the pressure on the evaporator side of the valve exceeds the pressure on the opposite side, the valve opens, allowing this pressure to flow to the compressor. During the off cycle, the small spring closes the valve, not permitting any flow from the suction line into the colder evaporator.

Thermal Service to Handle Va. Smelting Products

ST. PAUL—Thermal Service Co., Inc., 2490 University Ave., refrigeration and air-conditioning supplies jobber, has been appointed distributor of Virginia Smelting Co. refrigerants in this territory.

Bibb-Saxon Open Repair Shop in Dallas

DALLAS—Bibb-Saxon Refrigerating Engineers has opened a modern service and repair shop at 2632 Swiss Ave. Before their consolidation, both Mr. Bibb and Mr. Saxon had had considerable experience in independent service and installation work.

Keller Leases New Business Site in Seattle

SEATTLE—The Keller Service Co., servicing refrigerators, radios, and oil heaters, has leased the business site at 1824 Seventh avenue here.

'Water Rater' Aids Hotpoint Water Heater Salesmen

CHICAGO—To aid Hotpoint water-heater salesmen in analyzing customers' hot-water requirements quickly and accurately, the water-heater section of Edison General Electric Appliance Co. has produced a pocket-sized estimator called the "water rater."

The water rater is printed on polished celluloid in multiple-dial form. The dials revolve, showing the various computations through die-cut openings. With this gadget, salesmen can estimate with reasonable accuracy the size water heater needed by the customer, the approximate kilowatt hours it would consume per month, and the total number of gallons which the family would require for a maximum day's usage.

St. Louis Norge Outlet Moves To Larger Quarters

ST. LOUIS—Norge Co. of Missouri, distributor, has moved its offices from 4000 Laclede Ave. to the Mart Building, where it occupies 25,000 square feet of space, an increase of 11,000 square feet.

Twelve new employees have been added to care for increased business in Norge equipment, reports A. E. Bottenfield, president.

REFRIGERATION SUPPLY JOBBER ACTIVITIES**Alter Co. Revamps Jobbing Quarters**

CHICAGO—Extensive alterations have been completed in the four-story building of Harry Alter Co., local jobber of refrigeration parts and supplies.

The refrigeration and air-conditioning parts and supplies department was moved to the second floor in order to concentrate the stock of parts on one floor. Orders now can be filled on one floor, greatly increasing the speed and efficiency of counter sales.

A specially built charging room for sulphur dioxide and methyl gas has been constructed. This room has a special Texacoat covering which protects any metal from corrosion, even from these gases. Several thousand pounds of gas are kept in stock.

The charger room blower is driven by a 1-hp. motor which takes care of 3,000 cu. ft. of air per minute, and prevents any trace of gas odor despite the fact that one side of the room is open.

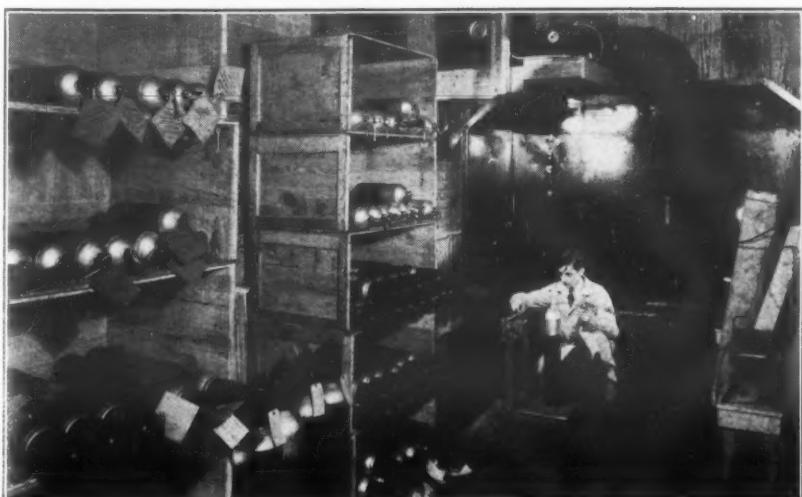
Automatic Heating & Cooling Supply Is New Chicago Jobber

CHICAGO—Automatic Heating & Cooling Supply Co., with headquarters at 641 West Lake St., is carrying a complete stock of standard refrigeration parts for service men, in addition to a stock of equipment for large cold storage, heating, and air-conditioning installations.

The company has also taken on the entire line of products manufactured by Peerless of America.

William F. Hauber, formerly with Steel Sales Corp., agents for Mueller Brass Co. and Wolverine Tube Co., is sales manager of the new local jobbing firm, which has branch offices on Chicago's south side, Evanston, and Maywood. Policy of the company is to sell to service engineers and air-conditioning contractors only.

Mr. Hauber declares that Automatic Heating & Cooling Supply Co. will maintain 24-hour service at all times.

Alter's New Refrigerant Charging Room

View of the specially built charging room for sulphur dioxide and methyl chloride in the remodeled building of Harry Alter Co., Chicago refrigeration supplies jobber.

PERFECTION Refrigeration Parts are Certified to Excel

Ask for catalog covering complete line of Compressor Parts, Valves, Condensing Water Regulators, and Fittings

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REFRIGERATION PARTS CO.
HARVEY, ILLINOIS**BUYER'S GUIDE**

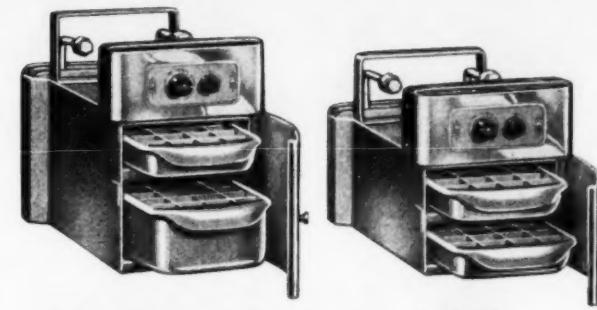
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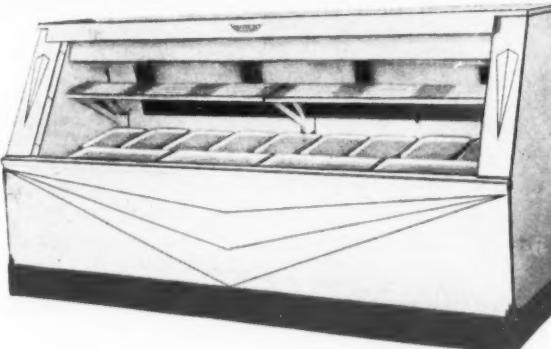
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CORKBOARD INSULATION
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TRIPLE GLAZING-RUBBER DOORS
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FOGEL REFRIGERATOR COMPANY

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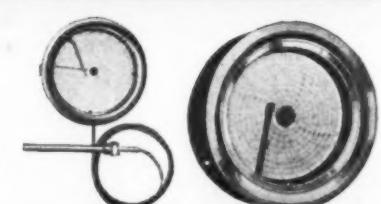
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MARSH recording instruments leave their permanent record of the slightest variation in temperatures and pressure.

Modern practice in air conditioning and refrigeration work calls for an exact knowledge of every factor that influences efficient operation. Marsh recording gauges and thermometers provide the most effective method of making a continuous study of performance.

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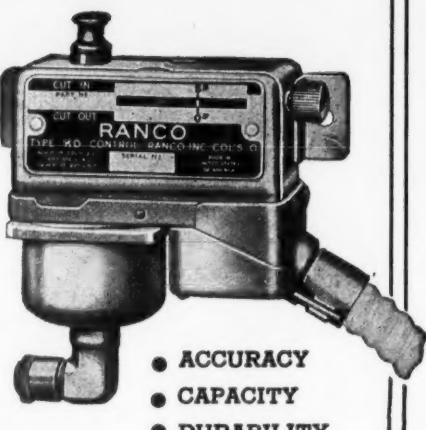
Marsh recording gauges and thermometers are available for all applications. Charts of recording pressure gauges read in pounds per square inch or in atmospheres in accordance with refrigerant used. Recording thermometers are available in standard ranges for all applications and with bulbs suitable for all media. Multiple pen instruments can be used to record on one chart, temperatures at several points or both pressure and temperature.

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New Type KO --- A "KNOCK-OUT"

Ranco was first with a dependable, compact thermostat for domestic refrigerators. Ranco was first with Stainless Steel. And now Ranco offers an outstanding new Stainless Steel Control for Milk Coolers, Ice Cream Cabinets, Walk-in Coolers, Water Coolers, Air Conditioning and general commercial use.

Ranco Type KO—for either pressure or temperature control—features compact construction, outstanding accuracy, dependability! Differential adjustable as low as 4 pounds, or 4 degrees F., on pressure and temperature controls, respectively. High electrical capacity. Ranco overload protection. Write today for bulletin 691.

RANCO, Inc., Columbus, Ohio

Air Conditioning MADE EASY

Presented below is a continuation of Section 7, Heating, of AIR CONDITIONING MADE EASY, by F. O. Jordan, air-conditioning editor of the News, and former assistant chief engineer of Airtemp, Inc.

The following instalments of the manual have appeared in the News:

What is Air Conditioning?—Sept. 23.
Section 1, Introduction, and Section 2, Definitions and Simple Thermodynamics—Sept. 30.

Section 3, Coil Performance—Oct. 7 and 14.

Section 3A, Water Cooler Performance—Oct. 14.

Section 4, Condensing Unit Performance—Oct. 21.

Section 5, Air Movement and Ventilation Requirements—Oct. 28.

Section 6, The Complete Air-Conditioning System for the Cooling Season—Nov. 4, 11, 18, and 25.

Section 7, Heating—Dec. 2, 9, 16, 23, 30, Jan. 6, 13, 20, 27, Feb. 3, 10, 17, and 24.

Bozorth to Direct Airtemp Advertising & Promotion

DAYTON—Appointment of Edward Bozorth as advertising manager and director of sales promotion for Airtemp, Inc., air-conditioning subsidiary of Chrysler Corp., has been announced by Col. A. C. Downey, president.

During the past year, Mr. Bozorth has been associated with J. Stirling Getchell, Inc., New York advertising agency, where he was in charge of Airtemp copy.

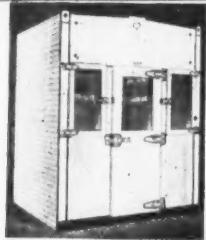
He was formerly with the New York advertising firm of Batten, Barton, Durstine, and Osborne, and with the Charles Dallas Reach agency where he handled copy for Carrier Corp.

Mr. Bozorth will have his office at Airtemp's main factory here.

Becher Plumbing & Heating Co. Granted Carrier Franchise

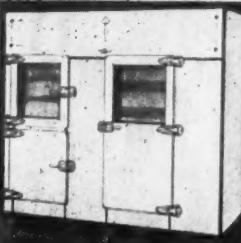
CANTON, Ohio—The Becher Plumbing and Heating Co., 200 Ninth St., NW, has been appointed Canton territory agent for Carrier Corp. Harley E. Becher is head of the local firm, and S. L. Feiner director of the sales and engineering department.

DISTRIBUTORS WANTED



Percival equipment
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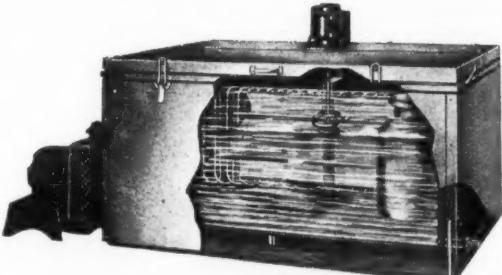
Percival's complete line will increase
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Desirable territories still
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51 years of service to
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Modern Dairy Farmers Want Modern Equipment

Sell them the **WILSON VERTI-COIL**



THE Wilson Verti-Coil Cooler revolutionizes milk cooling; gives dealers a sales story that measures up to modern dairy demands. The Verti-Coil gives greater cooling surface, induces natural circulation of water, provides more room for cans, assures rapid and uniform cooling. This patented coil can be used with any compressor unit at a cost of but a few cents per day. Cools milk to below 50° in less

than an hour—meeting any milk temperature requirement. It pays to sell a milk cooler line that solves the modern dairyman's problems. Write for dealer proposition today.

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Piping and connections must be so installed as to avoid strain due to expansion and contraction.

All piping must be supported on 10-foot centers by means of adjustable iron expansion hangers.

Legless radiators must be securely supported and anchored by adjustable expansion brackets.

All piping must be neatly installed near walls parallel to construction as is consistent with proper pitch.

All piping must be full-threaded and made up with good grade of dope, and must be reamed if 2 inches or smaller. If desired, joints may be welded.

Unions must be provided near all valves, and where necessary to facilitate removal of piping or equipment.

All valves, pump glands, etc., must be packed with a good grade of packing.

Particular care must be taken to prevent cutting, dope, etc. from entering piping, and the entire system must be flushed out before traps are installed.

Radiators and returns (for gravity or vapor systems) must be kept not less than 18 inches above the water line of the boiler (or condensate receiver).

Rises in (vacuum) return lines must be made through lift pockets, 5 feet being the maximum lift at one lift pocket.

Strainers are to be installed at the entering side of all drip traps.

Pipe must be continuous between fittings, with as few couplings as possible.

3. Codes: All work and materials must be in strict accordance with all codes and regulations having jurisdiction.

4. Scheduling of Work: All work must be so scheduled as to avoid interference with the work of other trades, and the system must be in operation in ample time for drying out plaster.

5. Other work: All openings and framing for same for ducts, and openings and sleeves where necessary for piping, will be provided by other contractors, as directed by the heating contractor. In the event that the heating contractor does not furnish such information when needed, any extra expense will be borne by him.

The building contractor will leave for a reasonable time any necessary openings for bringing heating equipment into the building.

6. Damage: Any damage resulting from the work of the heating contractor will be made good by him, to the satisfaction of the owner's representative.

7. Direct Fired Furnace (for the direct fired system only): The furnace shall be of welded steel (cast iron, etc.) construction with proper refractory-lined combustion chamber, specially designed for oil burning (hand firing, etc.) and for forced air (or natural) circulation. Proper casing and baffles must be provided for directing the airflow against the heating surface.

The furnace must be guaranteed to have not less than sq. ft. of heating surface, not less than inches fire pot diameter, and must develop not less than B.t.u. per hour when used with a standard burner at gal. of No. oil per hour, with a stack temperature not to exceed ° F. when (Concluded on Page 23, Column 1)

Dayton V-BELTS

Dayton V-Belts are the logical choice for all types of appliances, because they provide silent, dependable transmission—because their powerful grip prevents slippage—because they run smoothly without weaving, twisting or vibrating. A nearby distributor carries a complete stock.

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WORLD'S LARGEST MANUFACTURER OF V-BELTS

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- AIR CONDITIONING MADE EASY -

Radiators & Unit Heaters; General Specifications for Heating Systems

SECTION NO. 7 (Continued)

HEATING

BY F. O. JORDAN

Radiators—Unit Heaters

Generally speaking, a direct radiator is a unit containing steam or hot water, so designed that it has a large amount of surface in proportion to the volume of steam or hot water contained, which is used for heating the surrounding air by condensing the steam or cooling the hot water, and giving off the resulting heat from its external surface.

A portion of this heat is delivered by radiation and a portion by convection, due to the natural gravity circulation imparted to the air by the heating action of the radiator.

The radiator usually is constructed of cast iron, or of brass, copper or aluminum. Except in the case of the cast iron radiator, the outside surface generally is greatly increased by extending fins from the tubes through which the heating medium is circulated.

The radiator should be located so that the circulation of air over its surface is unimpeded, and should be placed at the point of greatest heat loss.

From the viewpoint of heating only, the ideal location for the radiator is under the window, as the warm upward moving convection current from the radiator eliminates the cold down-draft from the window. However, since such warm convection currents tend to soil curtains, this location generally is highly objectionable to the housewife.

Radiators may be surface mounted upon the wall, or may be recessed, or may be concealed. With the latter arrangement, proper openings must be provided above and below the radiator so as to provide natural gravity circulation of air from and back into the space to be heated.

Since such natural circulation is produced by the tendency of the warmed air to rise, the circulation of air and effectiveness of the radiator will increase with effective height of the air passage as measured upward from the bottom of the radiator.

The radiator must be so mounted that there is no strain upon mountings or connections, due to contraction and expansion of the radiator or piping.

A widely used heating unit consists of a radiator (generally of the extended surface type) past whose surface air is forced or drawn by a motor-driven fan, the whole generally being enclosed within a suitable housing. Such units are known as "unit heaters." The fans may be either of the propeller or the blower type.

When such units are designed for use in the home, school room, or office, they generally are placed beneath a window and discharge vertically. When intended for use in large spaces, such as shops, warehouses, etc., the unit generally is located overhead and discharges horizontally, or obliquely downward, preferably toward the points of greatest heat loss. All unit heaters should be so

located as to obtain a good general circulation over the entire space to be heated.

The unit heater, especially if the circulating fan is of the blower type, is largely used as a central unit, distributing through a suitable duct system. A modification of the unit heater is widely used in the basement or other available space of the home, for heating through ducts.

Radiators and unit heaters may be controlled, and must be provided with proper means of preventing condensate and air pockets, as discussed elsewhere in this section.

Specifications

The following brief specification outline covering heating materials is based upon common good practice in the heating industry. These specifications, of necessity, have been made quite general, so that judgement must be exercised in applying them to the specific project.

1. Type of System: This specification contemplates the furnishing of all labor and materials necessary for a complete two-pipe vapor (or other) heating system, including boiler, burner, air-heating unit, air-distributing duct system, radiators, piping, valves, controls, etc., as shown on the plans or as specified.

Briefly, the heating system will consist of an air-heating and circulating unit located in the basement and circulating air through a system of ducts and registers to the major portion of the building, and direct radiators in other portions where shown, together with a boiler-burner unit which will supply steam to the air-heating unit and radiators through a suitable piping system.

2. Character of Work: All steam radiators, steam-heating units, and all low points in steam lines are to be drained through proper traps.

All steam lines must be pitched $\frac{1}{10}$ of an inch per foot in direction of flow, if over 6 feet in length. If under 6 feet in length, steam lines may be pitched $\frac{1}{10}$ of an inch per foot in direction of flow, or $\frac{1}{4}$ of an inch per foot against flow.

Dry returns must be pitched $\frac{1}{10}$ of an inch per foot in direction of flow. Wet returns may be level.

Hot water heating lines must be pitched upward from boiler $\frac{1}{10}$ of an inch per foot.

Steam gravity or vapor dry returns must be vented through automatic combination float and thermostatic air valves before dropping to wet returns. Radiators for steam gravity systems must be similarly vented. Air valves for vapor systems must be of the non-return type.

Hot water heating lines must be vented through automatic float air valves—at all high points, except where vented through an open expansion tank. Hot water radiators so located that they cannot vent upward to a main must be provided with hand vents.

General Specifications to Be Followed In Installing a Heating System

(Concluded from Page 22, Column 5) used with a stack of (state stack height and dimensions).

8. Boiler: The boiler shall be welded steel (riveted steel, cast iron sectional, etc.), for low pressure steam, or hot water heating, etc.) specially designed for stoker (hand, oil, or gas) firing. All material and construction shall be in strict accordance with all the latest codes and regulations having jurisdiction.

The boiler shall be guaranteed to have not less than the following:

..... sq. ft. of effective heating surface.

..... sq. ft. of effective grate area.

..... sq. ft. of steam liberating surface.

..... cu. ft. of combustion space.

..... lbs. per hour normal steaming capacity (or capacity of heating

..... lbs. per hour of water through

..... ° F. temperature), with maximum flue gas temperature of ° F. at damper.

The boiler (if for hot water) is to be provided with all proper trimmings, such as pressure relief valves and water pressure gauge, and with valved openings for drain, hot water outlet, and return inlet connections.

The boiler (if steam) is to be provided with all proper trimmings including safety valves, steam gauge, and water column with try-cocks and water glass, and with proper valved openings for blow-off, make-up water, steam and return connections. The lowest try-cock must be set not less than 1 inch above the tops of the highest tubes.

9. Stoker: The stoker shall be of the underfeed (overfeed, etc.) type, complete with hopper, plunger (screw, etc.) feed, rear (or side) dump, forced draft fan, motor drive, all necessary wiring and controls included—(see "automatic controls" above, etc.), and shall be specially designed for low-pressure heating service. All materials and construction must be in strict accordance with all of the latest codes and regulations having jurisdiction.

The stoker shall be guaranteed to burn completely not less than lbs. per hour of bituminous (or other) coal and deliver not less than B.t.u. per hour to the above boiler under normal operation, with a stack of (state height above grate, and inside dimensions of stack).

OIL BURNER HEATING

10. Oil Burner: The oil burner shall be of the gun (rotary, or pot) type, complete with gallon tank, electric (or gas) ignition, and all necessary piping, wiring, and controls. All materials and construction must be in strict accordance with all of the latest codes and regulations having jurisdiction.

The oil burner shall be guaranteed to operate satisfactorily when burning No. oil, shall be guaranteed to burn not less than gallons per hour of such oil, and shall deliver not less than B.t.u. per hour to the above boiler under normal operation, with a stack of (state height above grate, and inside dimensions of stack).

11. Gas Burner: The gas burner shall be complete, including necessary piping, wiring, and controls. All materials and construction must be in strict accordance with all of the latest codes and regulations having jurisdiction.

The burner shall be guaranteed to operate satisfactorily when burning gas with a heat content of B.t.u. per cu. ft., shall be guaranteed to burn not less than cu. ft. per hour of such gas, and shall deliver not less than B.t.u. per hour to the above boiler under normal operation, with a stack of (state height above grate, and inside dimensions of stack).

SPECIFYING CONTROLS

12. Automatic Controls: A clock-type room thermostat is to be provided in the room, of a type which will maintain one temperature during one period of the 24-hour day, and which will change automatically to some other temperature during the remainder of the 24-hour period. This thermostat is to control the operation of the oil burner, and is to operate without "flutter" on a 3° differential. A pressure-stat is to be provided for starting the fan in the air-circulating and heating unit when the desired steam pressure exists within the heating coil.

In addition to these controls, the following controls are to be provided with the oil burner (see "automatic controls" above).

Controls for other types of systems should be as described in the paragraphs on "automatic controls" in this Section.

UNIT HEATERS

13. Air-Heating and Circulating Unit or Unit Heater: This unit is to be a factory-built unit, consisting of fan, motor, drive, humidifiers, filters, and heating coil, together with the necessary metal chassis and housing for enclosing the constituent part and forming a complete, compact, fully-enclosed unit.

Construction must be sufficiently heavy to obtain rigidity and freedom from rattling. Proper doors or panels must be provided for giving access to all parts, and oilers must be extended to easily accessible points.

All metal parts must be copper-bearing furniture steel or equal, properly protected against rust or corrosion.

The entire housing must be insulated with not less than $\frac{1}{4}$ -inch-thick insulation of a type impervious to moisture.

The entire exterior must be given the equivalent of one prime and a two-coat enamel finish.

Fans must be approved centrifugal blower type, with the equivalent of ring-oiled, self-aligning sleeve bearings.

The motor is to be one-phase, 60-cycle, 110 or 220-volt, 40° totally enclosed with sleeve bearings.

The drive is to be approved V-belt as necessary.

The heating coil is to be approved extended surface type, specially designed for low resistance high efficiency heating service, set so as to avoid water logging and air binding. The humidifier is to be non-clogging spray type with strainer and copper drain pan.

Filters are to be 2-inch-thick steel wool or glass, standard removable cells.

Air velocity through heating coil is not to exceed 500 f.p.m., and through filters is not to exceed 300 f.p.m.

With steam at 2 lbs. pressure, and water at 25 lbs. pressure, the unit must deliver not less than B.t.u. per hour heating capacity, gallons per hour humidifying capacity, and c.f.m. air-delivery capacity against a static due to ducts and registers not to exceed $\frac{1}{8}$ inch.

If a condensate pump and receiver is desired, use the following.

PUMP AND RECEIVER

14. Condensate Pump and Receiver: This unit is to consist of a rust-proof receiver, and a motor-driven, direct-connected, brass or bronze fitted cast iron condensate pump, complete with glands, seats, float switch control, and magnetic strainer, all mounted on one rust-proof combination base and drip pan.

The receiver shall be provided with drain, overflow, open vent, condensate inlet, pump suction, and gauge glass.

The receiver capacity shall not be less than gallons, the motor shall not be less than hp., and the pump capacity shall be not less than g.p.m. against a discharge pressure not less than lbs. per sq. in.

If a vacuum system is desired, use the following:

A. Vacuum Pump and Receiver: This unit is to consist of a rust-proof receiver, and motor-driven, direct-connected, brass or bronze fitted condensate and vacuum air pumps, complete with glands, seals, float switch and vacuum switch controls, and magnetic starter, all mounted on one rust-proof combination base and drip pan.

The receiver shall be provided with suction strainer, return connection, drain connection, combination pressure and vacuum gauge, vacuum breaker, and gauge glass.

The receiver capacity shall be not less than gallons, the motor shall not be less than hp., and the unit shall be capable of serving not less than sq. ft. of equivalent direct radiation, while maintaining a minimum vacuum in the returns of 10 inches of mercury and discharging against a pressure equal to 15 lbs. per sq. in. with not over 50% continuous running time.

The motor and controls shall be for phase, cycle, volt circuit.

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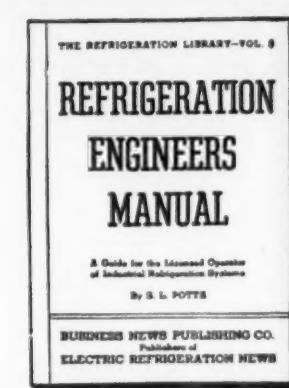
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If a return trap is desired, use the following:

B. Return Trap: Brass or bronze fitted cast iron, with equalizing vent, and condensate connections, and gauge glass. Capacity, sq. ft. E.D.R.

15. Traps: Traps are to be of ample capacity, and are to be provided for all radiators and heating units, and at all steam system drips (for vacuum or vapor systems).

Radiator traps are to be thermostatic type, guaranteed to pass air and condensate, and not to pass steam at steam pressures up to 5 lbs., and at return vacuums up to 10 inches of mercury.

Other traps are to be inverted bucket (regular bucket, or float) brass or bronze fitted cast iron with thermostatic air by-pass. (If returns are to be sub-atmospheric at any time. Otherwise, use thermostatic air vent.)

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16. Air Valves: (For Gravity Steam) Brass or bronze, combination float and thermostatic "quick vent" type. (For Vapor) Brass or bronze, combination float and thermostatic non-return type. (For Hot Water) Float type.

17. Hand Valves: All brass or bronze, screwed type, for 2 inches and under.

Brass or bronze fitted cast iron for over 2 inches, screwed if under 6 inches, flanged if 6 inches or over.

Non-rising stem for under 4 inches, OS & Y for 4 inches and over.

Use globe valves with renewable seat and disc where used for throttling. Other valves must be gate valves.

18. Radiator Valves: Brass or bronze, chromium plated, packless bellows type, with wood or ventilated wheel, and with indicating plate.

19. Check Valves: Brass or bronze 2 inches and under, iron body brass or bronze fitted over 2 inches, with renewable discs.

20. Pressure Reducing Valves: Iron body, brass or bronze fitted, with Nitriloy or equal hard seat, and ample diaphragm for positive shut-off at low load, guaranteed to maintain lbs. pressure in low-pressure main with lbs. high pressure, at flow-rate between lbs. per hour and lbs. per hour.

21. Relief Valves: Iron body brass or bronze fitted, guaranteed to relieve at any desired pressure within the range of lbs. and lbs. and to pass not less than lbs. per hour of steam at any pressure within that range.

OTHER EQUIPMENT

22. Strainers: Iron body, with brass plugs and removable basket strainers.

23. Radiators: Cast iron "water type" with (or without) legs, joints between sections to be steam and water tight push nipple type, or—

A. Extended surface or fin and tube type, all bonds between prime and secondary surface to be efficient and permanent. Arrangement of tubes and surfaces to be for low resistance to steam (or water) and air flow. All materials to be copper, brass, or aluminum.

24. Pipe and Fittings: Steel (or genuine wrought iron, or Toncan iron, etc.) pipe of standard weight, lap welded where over 2 inches nominal size, with standard cast iron fittings, screwed where under 6 inches and flanged where 6 inches or over. Welded tube turns and branches may be used if desired, or—

A. Semi-annealed, seamless drawn, standard iron pipe size brass pipe with cast iron pipe size fittings, or—

B. Copper tubing with soldered fittings.

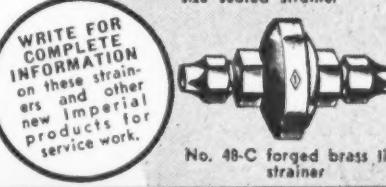
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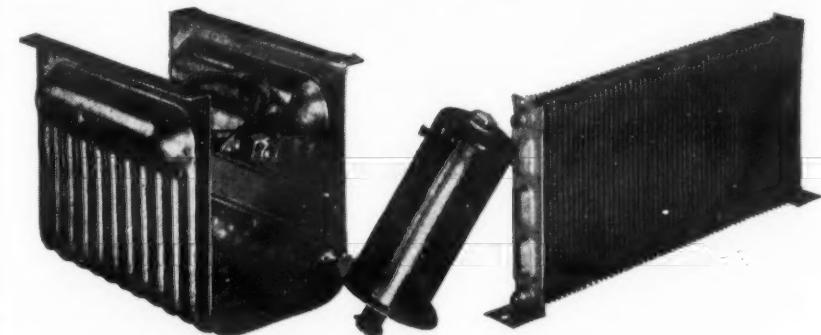
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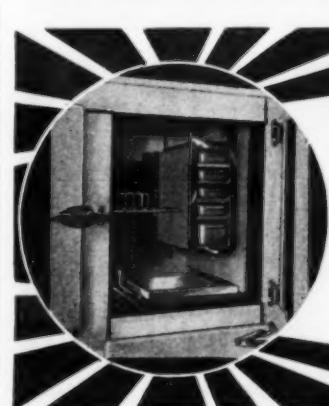


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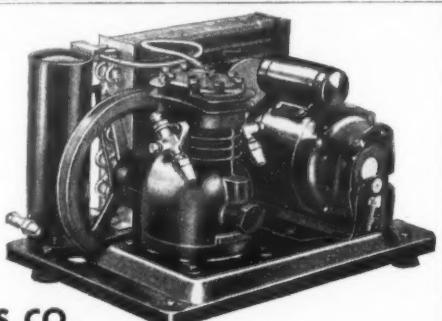
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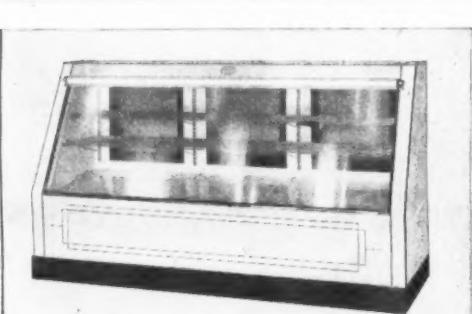
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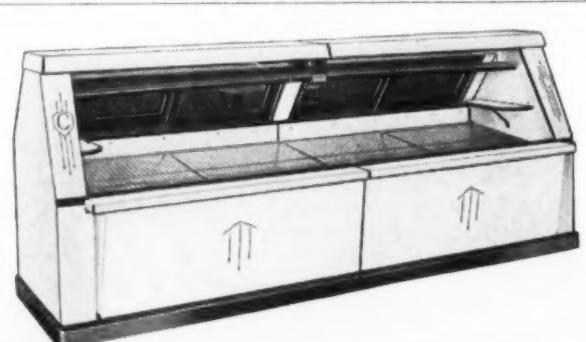
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The Sun Load Problem in Air-Conditioning Heat Gain Calculations

About as many methods are in use for guessing at the probable sun load upon air-conditioning equipment as there are concerns in the business, while a procedure in common use when considering the time required for sun effect to pass through the structure is to admit that there may be such a thing as "lag," then to ignore it—and hope for the best.

The importance of an accurate estimate of the heat load imposed by the sun arises from the fact that the sun's heat frequently constitutes the major portion of the air-conditioning load. A satisfactory estimate of the actual peak-equipment load cannot be made without the use of an accurate method of estimating the

time of the arrival of the heavy sun load within the conditioned space, for otherwise the engineer or contractor cannot know which loads to add up in arriving at the actual simultaneous air-conditioning load upon which the ideal equipment selection must base.

In the following article authentic test data is used for deriving a simple but accurate method of estimating the quantity of heat due to sun effect which actually arrives within the conditioned space, together with the time of its arrival there.

An attempt is made to apply actual data to the development of a standardized method of estimating the air-conditioning load for the installation engineer.

— AIR CONDITIONING ENGINEERING —

Early Data on Figuring Solar Radiation Load Reviewed as Applicable to Today's Installation Problems

BY F. O. JORDAN

INCONSISTENT with the modern tendency to standardize is the existing lack of standardization in the methods used by air-conditioning men for estimating the cooling load upon summer air-conditioning equipment. And it is unfortunate as well.

It is unfortunate because frequently the methods and factors are not consistent. Obviously, differing answers to the same problem indicate that somebody must be wrong. And the inevitable result of a wrong answer to this particular problem means that some purchaser pays too much for an oversize installation, or that he gets an installation which cannot keep him comfortable. In either case, the customer eventually gets hot under the collar, and does the standing of air conditioning no good.

Another unfortunate effect of the submission of widely varying load estimates on a competitive job is that the prospect is given the impression that nobody knows what it is all about. More than once under such conditions, once "hot" prospects have been known to cool to the extent of calling off the whole thing until the air-conditioning industry learns something about its own business.

Doubtless one of the factors which contribute to this particular form of delinquency is the wide variation in current methods of guessing at the probable effect of the sun upon the equipment load. Therefore, it becomes evident that a standardization upon this will be a long stride in the direction of complete standardization.

In order to avoid long strides in a direction which might lead to an even less desirable status, it will be quite necessary to get started right.

Various tests upon sun effect have been carried out whose results might have been used as a basis for consistent and dependable methods of estimating sun load. However, due either to lack of coordination of the industry's functions or to lack of realization of the importance of the problem, very little has been accomplished in the way of placing such data in daily use.

In 1932 a paper entitled, "Heat Transmission as Influenced by Heat Capacity and Solar Radiation" was presented by the Research Laboratory of the American Society of Heating and Ventilating Engineers. The advisability of accepting such ancient data might be open to question except that pyrheliometers, potentiometers, and other scientific instruments of great accuracy were used in obtaining it. And of course, sunshine like human nature behaved much the same even during the Hoover Administration as now.

Sun load is defined as the heat which enters the conditioned space because of the direct impingement of the sun's rays upon the structure surrounding the conditioned space.

In addition to sun load is the heat which enters the conditioned space via transmission through the enclosing structure due to the differential between outside and inside dry

temperature of the surface rises to a maximum at noon and then recedes, a wave of heat advances.

"Because heat is required to raise the temperature of each increment of the distance, the rate of heat flow past any point diminishes as the wave penetrates through the structure, and when the wave reaches the inner surface, it has a much lowered amplitude, dependent upon the conductivity, density, specific heat and thickness of the material in the wall, the film resistance of its lower surface, and the temperature of the air below. The crest of the wave reaching the inner surface will be delayed a certain time after the crest at the exterior surface.

"Conductivity, density and specific heat are factors which combine to damp out the wave amplitude. In a theoretical consideration of heat transfer they are combined into a single constant (h), called the diffusivity:

$$h = \sqrt{\frac{k}{\rho c}}$$

where

h = diffusivity
 k = conductivity
 c = specific heat
 ρ = density

"This combined constant takes into account the resistance to heat flow and the heat capacity of the structure.

"The heat reaching the inner surface tends to build up its temperature, and a small amount of heat returns in a reflected wave upward towards the outer surface. The magnitude of this reflected wave also depends upon the physical properties of the structure. Only the heat entering the air-conditioned space below is of interest to the air-conditioning engineer.

"An ideal solution of the problem of heat flow as affected by solar radiation would determine the heat flow into the conditioned space for all hours of the day as a function of the intensity of solar radiation perpendicular to the direction of the sun's rays, of the atmospheric conditions, and of the physical characteristics of the structure.

"Such a solution involves the following factors: the intensity of solar radiation perpendicular to the direction of the rays; the angle of incidence of impingement against the surface; the reflected energy depending upon the angle of reflection; the radiated heat depending upon the convection from the exterior surface; the difference in temperature of the exterior surface and the outside air; the temperature difference between outside and inside surfaces; the conductivity, the density, specific heat and thickness of structure; the film resistance for the surfaces; and the

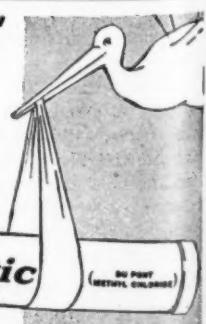
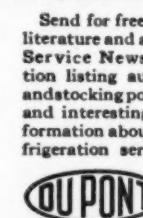
(Continued on Page 25, Column 1)

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Using Heat Transmission Coefficients For Common Building Materials in Determining Solar Load

(Continued from Page 24, Column 5) controlled temperature of the air below. This makes thirteen factors, the first five of which are harmonic functions of the time."

If every field man were a scientist, and if his annual quota were to estimate sun load upon one project per summer, then these 13 factors might become the basis for our standardization. But since this is not true, we must search further.

Since transmission coefficients for all common building materials are known, a simple method of computing sun load would be to determine a relationship as ratio between transmission load and sun load for various materials, and apply this ratio as a multiplier to the common transmission coefficient when sun load is to be estimated.

This is done in Table 1, which was condensed from data tabulated during the tests.

From the Fig. 1 tabulation the following average values may be taken as ratios between the load due to sun effect plus transmission, and the load due to transmission only when no direct sun effect is present.

Material	Multiplier for Sun Effect
Wood	3.00
Concrete	1.60
Gypsum	3.25
(comparison of physical characteristics indicates the following probable multipliers also)	
Metal (insulated below)	2.50
tile	2.50

The above materials are for roof surfaces. According to the paper upon which this discussion is based, sun effect upon walls at the latitude of Pittsburgh is about 80% of the effect upon roof surfaces.

Using this factor, the multipliers for walls become:

Wall	Multiplier for Sun Effect
Brick	2.00
Tile	2.00
Stone	1.50
Concrete	1.25
Wood	2.40

Based upon the above analysis, the procedure for estimating the heat load which enters the conditioned space due to sun effect plus ordinary transmission, is to multiply the transmission load as estimated by the use of standard coefficients, by the proper multiplier selected above.

However, the magnitude of sun effect falls far short of being the entire story because of the fact that the world goes round and round, and because a time interval intervenes between the moment that a given sun ray impinges against an exterior surface of the structure, and the moment that its heat penetrates to the conditioned space.

In simple language, the maximum sun ray may strike the roof of the restaurant at high noon when it is full of people, but its heat may not register within the dining room until long after the diners have become pedestrians again, so that the air-conditioning system may not be called upon to carry sun load and occupancy load at the same time.

To use the language of the paper, "Research, carried on by the Research Laboratory of the American Society of Heating and Ventilating Engineers at the Pittsburgh Station of the United States Bureau of Mines, has shown that a large error may be introduced into the calculations by failure to consider the periodic character of heat flow resulting from the diurnal movement of the sun and the heat capacity of the structure, which determine the timing and magnitude of the heat wave flowing through the walls into a building on a hot, sunny day."

Fig. 1 shows a lag of about four hours for a 6-inch concrete roof.

Tests were performed upon certain structures during the course of the investigations which showed lag values of as much as 24 hours. Such lengthy lag periods probably are the correct explanation of more than one instance when results of certain air-conditioning installations have refused to agree with estimated ones.

According to F. C. Houghten, director of the research laboratory:

"The test equipment for studying the effect of solar radiation on heat transfer was built on the flat roof of a low building at the Pittsburgh Station of the United States Bureau of Mines, so situated that at no time during the day was the roof without an unrestricted view of the sun.

"Provision for maintaining constant temperatures and humidities in the space below the roof panels was furnished by an ice-cold water spray, a well-distributed low-intensity 500 watt electric heater and a thermostat. Cold water was pumped through insulated piping to the cooling spray by a rotary gear pump from an insulated ice bath in the room below. The spray water was caught in a receiver and returned to an ice bath by gravity. By varying the volume of spray water, the amount of cooling needed to maintain the air space at any predetermined temperature was readily controlled. The spray maintained the relative humidity of the conditioned air at a constant sufficiently low to prevent condensation on any of the interior surfaces. When heating was necessary, a thermostat by regulation relays controlled the current passing through the heater.

"Nicholls heat flow meters were firmly fastened to the lower and the upper surfaces of the panels, and their edges were sealed to the panels with adhesive tape. These meters

gave the instantaneous flows of heat for both the upper and lower surfaces. The upper meters were covered with black oilcloth to protect them from the weather. To obtain uniform, natural surfaces, the upper cloth and lower meter surface were painted a dead black with lampblack pigment thinned with weak shellac.

"Thermocouples of No. 36 gage B & S Copper-contracted wire were fixed in positions on the top surface of the weather proofing over each panel, between the top of the panels and the top meters, between the lower meters and the bottom surface of the panels, on the exposed lower surface of the lower meter, and 6 inches, 18 inches and 30 inches below the lower surface of each panel. A thermocouple for observing air temperatures in the sun was located 6 inches above the center of the middle panel; another thermocouple for observing shaded air temperatures was put under a double-deck shield and extra thermocouples were located at all important points to serve as checks. An electrical cup anemometer placed near the top of the panels recorded all air movement over the face of the panels.

"A pyrheliometer located near the setup indicated the intensity of solar radiation throughout the day. This instrument was designed and built at the A.S.H.V.E. Laboratory. It consisted of smoked, deadblack, sensitive disk, containing thirty-one hot junctions of No. 40 B & S gage thermocouples, the cold junctions of which were located between the flanged joint of a cup. When the instrument was sighted on the sun, the sun shone onto the sensitive disk through an orifice which was so designed that the sun entirely covered the thermocouple junctions in the disk, even when the instrument failed to point directly at the sun by an angle of 2°.

"This setup allowed three panels to be tested simultaneously with heat flow meters and thermocouples so arranged that at any time readings could be had of the instantaneous heat flow into the top and out of the bottom surfaces, and of the temperature gradients through the panels subjected to varying weather conditions at the outer surface and constant air-temperature below.

"The main object of the study being to obtain data for typical hot summer days, favorable weather conditions had to be anticipated by careful interpretation of Weather Bureau reports; a very light haze, or a few scattered clouds would make a test erratic. Many data were obtained which had to be discussed because, after several hours of good weather, clouds blanketed the sun, or a thunderstorm suddenly came up to wet the surfaces.

"An attempt was made to choose test panels which would cover a wide range of typical building construction, and which be used in the application of the theory.

"Earlier Laboratory tests have shown that ordinary single-strength window glass reduces the sun's intensity by about 10%, and allows 90% to pass through and become effective as heat in the interior of the room. The data shows that a glass surface normal to the sun allows about 275 B.t.u. per square foot per hour to pass through it. Accepting this value, calculation shows that a horizontal glass window would allow 260 B.t.u. to pass through it, and that an east and west vertical window would pass 196 B.t.u. and a south vertical window, 81 B.t.u."

As the result of the tests, a mass of the data was tabulated which was of great scientific interest, but which is not arranged in a form which lends itself readily to the daily use of the air-conditioning field man.

In order to effect such an arrangement, a simple formula involving the factors known to influence lag is suggested. Considering these factors, it appears that the resistance to heat flow of the structure and the heat storage capacity of the structure should determine the lag, since the resistance factor tends to regu-

(Concluded on Page 26, Column 3)

Fig. 1—Lag for 6-in. Concrete Roof

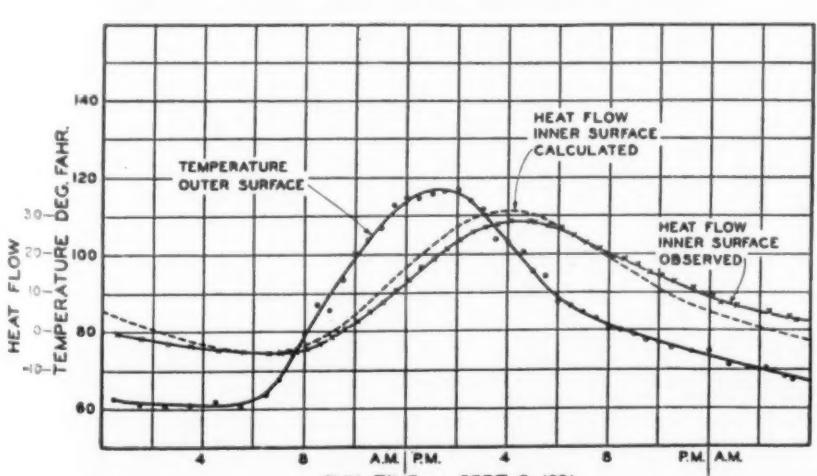


Fig. 1—Curves for 6-in. concrete panel showing outer surface temperature, observed inner surface heat flow, and inner surface heat flow as calculated by the empirical solution.

Table 1—Ratio between Transmission Load and Sun Load for Various Materials

Material of Construction	Thickness (Inches)	Overall Transmission Coefficient (B.t.u./sq. ft./hr.)	Temperature Diff. Between Outside and Inside Air (Degrees F.)	Transmission Between Outside Load B.t.u./hr. (Col. 3 x Col. 4)	Heat Entering Cond. Space as Measured (B.t.u./hr.)	Ratio Between Heat Entering Space and Transmission Load as Computed from Standard Coefficients	
						6	7
Pine	2.156	.32	24.80	7.94	26.0	3.28	
Pine	2.156	.32	27.90	8.93	25.5	2.85	
Concrete	6.188	.91	24.80	22.6	37.5	1.66	
Concrete	6.188	.91	27.90	25.4	40.8	1.61	
Gypsum	4.188	.30	23.30	7.00	22.2	3.17	
Gypsum	4.188	.30	28.30	8.50	28.0	3.30	

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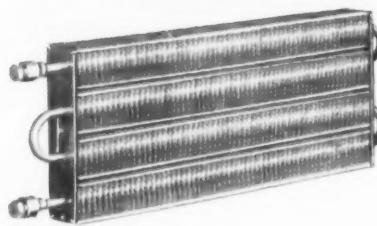
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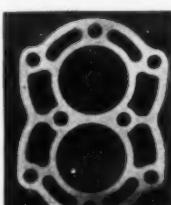
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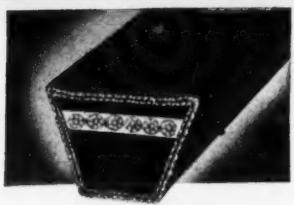
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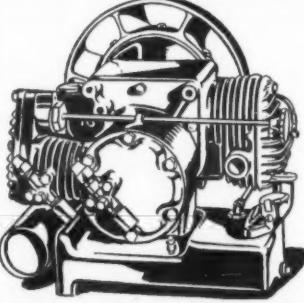
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Year-Around Air Conditioning Provided for New United Airlines Planes

SEATTLE—Air conditioning for air travelers—all-year-around air conditioning while on the "ramp" and in the air—is a reality for passengers traveling on the "Skylounge Mainliners" put in service by United Airlines.

The Skylounge Mainliner is the name given by the United to the latest Douglas commercial monoplanes, which recently were placed in service as extra-fare planes on United's transcontinental lanes of the air.

Structurally speaking, this model is the standard Douglas "D-3," the 24-passenger ship which has been converted into a roomy "parlor car," with movable lounge chairs for 14 travelers, while two motors cradling 1,150 hp. each are placed within its streamlined nacelles.

Generally speaking, air conditioning for the residence is based upon the premise that weather is to be about the only variable, as it is assumed that in all probability the house will remain in the same place. Even under these relatively stable conditions, the problem is deemed to

be somewhat complex in certain quarters. However, the problem of air conditioning the airplane is rendered much more complex by the fact that it habitually moves about at a high velocity, not only in the horizontal, but in the vertical dimension as well.

In addition to allowing for climatic variations, the solution of the problem must consider the ship under the following conditions:

Aloft in winter.

Aloft in summer.

Aground in winter.

Aground in summer.

For maintaining the desired condition of the air within the cabin during the "aloft in winter" status, water is heated by the hot exhaust gases that are discharged by 2,300 motor horsepower, the water heater being located just aft of the pilots cabin. The heat from this water is then imparted to outside air which, after being properly heated, is delivered to the interior of the cabin through a suitable system of ducts concealed in the ceiling.

This arrangement eliminates the possibility of exhaust fumes and

carbon monoxide reaching the passengers.

Each passenger may control the temperature within his immediate region to suit his individual taste by adjusting a ventilator which is provided at each seat to control the admission of unheated outside air at that point.

When the wayfarer is aloft in the summer time, comfort is provided for him in the form of cool pure air that always abounds in the upper levels, and which is admitted to the interior of the airliner through the same ventilators that are employed for air conditioning the ship in the winter.

When the ship is on the ground in the winter season, and the motors merely idling or not in operation at all, it is obvious that they cannot be depended upon for heating passengers. For such conditions a truck is provided at the airport, in which is installed a complete air-circulating and heating system.

When heat is needed in a standing plane, this truck placed alongside and properly connected to the heating system described above, maintains a desired temperature within the ship.

The heating truck is provided also with the cooling function in the form of an ice tank, which serves to cool travelers cross-continent bound.

— AIR CONDITIONING ENGINEERING —

Application of Test Data to Problems Of Installation Engineer

(Concluded from Page 25, Column 3)
late the flow of heat into the heat reservoir formed by the material of the structure, while the capacity to store up heat of the reservoir tends to influence the time required for the heat to pass through the structure into the conditioned space.

Apparently, an increase either in resistance or in heat storage capacity will result in an increase in lag. Obviously the heat storage capacity is equal to the product of its weight and its specific heat.

Therefore lag may be expressed as follows:

$$L = CWcR$$

L = Lag, or time in hours required for a given heat sun load to enter one surface, pass through, and be given off from the opposite surface of a given homogeneous construction.

C = Constant determined by test.

W = Weight in pounds per sq. ft. of construction at the thickness used.

c = Specific heat per pound of the material used in the construction.

R = Overall thermal resistance of construction at the thickness used, including the internal resistance of the material, the outside surface resistance (.166) and the inside surface resistance (.606).

All of these factors are available from current handbooks except C , which must be determined from the tests which are described above.

Table No. 2 shows condensed results taken from data obtained in the tests.

Since an average value of " C " from Col 8 of table No. 2 is .15, the equation for lag becomes.

$$L = .15 WcR$$

Based upon the above equation, curves for the common materials of construction are shown by Fig. 2.

By making use of lag values taken from Fig. 2, or computed from the lag equation, and by taking the time

of maximum exterior sun effect as tabulated below, it becomes a simple matter to estimate the time when maximum sun load will arrive within the conditioned space.

Surface	Time of Day when Maximum Effect is Imposed Upon Outside Surface
Roof	12:00 M.
East Wall	8:00 A.M.
West Wall	4:00 P.M.
South Wall	12:00 M.

In view of the above investigations the following rules seem logical:

1. For surfaces whose exposure to direct sunlight is less than one-half lag, use the transmission coefficient only. The reason for this is because a partial reversal of heat-flow from the material takes place as soon as the period of sun exposure is past. If the period of exposure is less than one-half of lag-time, very little sun load reaches the conditioned space.
2. For surfaces whose exposure is approximately equal to or greater than the lag, use the full sun effect. For surfaces whose exposure is only slightly greater than one-half the lag, engineer must use own judgment.

Table 2—Condensed Results of Test Data

Material of Construction	Thickness (Inches)	Resistance	Weight lb./sq. ft.	Specific Heat B.t.u./lb./ $^{\circ}$ F.	Heat Capacity Col. 4 x Col. 5	Log in Hours from Test Data	Constant Col. 7
Metal and Cork	2.670	6.25	13.76	.192	2.64	2.55	.1545
Pine	2.156	3.125	6.76	.467	3.15	1.46	.1490
Concrete	6.188	1.100	76.50	.230	17.60	3.00	.1485
Gypsum	4.188	3.333	22.60	.234	5.29	2.60	.1475
Average, $C = .15$							

Fig. 2—Curves for Common Materials of Construction

